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OLIVE OIL.

By Frank X. Moerk, Ph. G.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.—No. 50.

About two months ago I was presented with two specimens of Lucca oil by the agent in this city with the avowal that the oils were guaranteed pure and that they could be subjected to all known tests of purity; a little later samples of California oils were placed at my disposal by Prof. Trimble, the samples having been presented by the manufacturers through one of our late graduates to the college cabinet. The comparison of American with foreign olive oil to my knowledge never having been made, this task was undertaken and the results herewith made known. Each set of tests was made at the same time so as to insure like conditions and comparable results.

Specific gravity determined in 50 gram. bottle at 15.5° C.

Odor. On heating the oils in test tubes, only Cooper's oils gave a decided odor, resembling that of leather, due possibly to incipient rancidity.

Color tests. Sulphuric acid. Two drops acid placed upon twenty drops of the sample, the color noted before and after stirring.

Nitric acid. Three volumes oil agitated for two minutes with 1 volume nitric acid sp. gr. 1·42, observing the color of the oil after separation. Only a tinge of color was imparted to the acid.

Silver nitrate and *gold chloride* tests were applied as stated in Am. Jour. Pharm., 1889, p. 65. It appears that age and exposure with the latter test should be taken into consideration, as one of the oils tested

shortly after its reception did not give any reaction, but recently examined gave a purple color.

Elaidin reaction. 10 cc. oil agitated every ten minutes for two hours with 0·4 cc. of a solution of 1 cc. mercury in 12 cc. *cold* nitric acid, sp. gr. 1·42.

Temperature turbidity. 3 cc. oil and 3 cc. glacial acetic acid (99.5 per cent.) were heated until perfect solution ensued, when a thermometer was introduced and the temperature noted at which the lower portions became distinctly turbid. The higher temperature obtained for olive oil by E. Valenta and quoted in Allen's Organic Analysis may be due to the use of a weaker acid; in this country, it is stated, an eighty per cent. acid is very often sold as "glacial." This test is especially important as a means of detecting cruciferous oils which are not soluble in the acid even at its boiling point.

Free acid and *saponification equivalent* determined in the same test by first adding to a weighed portion, 2 to 3 gm. in a flask, 10 cc. neutral alcohol, boiling and titrating with approximately semi-normal alcoholic potassium hydrate, using phenolphthalein as indicator, until a permanent red color after agitation is obtained; the acidity is calculated as oleic acid. An excess of the alkaline solution is now added (the balance of 25 cc.), the flask connected with an inverted condenser and heated in a water-bath for one-half hour, after addition of a little more indicator the excess of KOH is determined with oxalic acid (12.6 gm. per litre); the difference between the oxalic acid required in this experiment and that required in a blank experiment (carried out without the oil) represents the acid, as oxalic acid, necessary to decompose the oil; to obtain the saponification equivalent, which is the amount of oil decomposed by 56.1 parts KOH or 63 parts oxalic acid, the weight of oil taken is multiplied by 500 and the product divided by the number of cc. of oxalic acid of above strength gotten as the difference between the actual and blank experiments. Oxalic acid was used because it can be obtained of such purity that it does not require the repeated trials in standardizing; there is a precipitate of oxalate of potassium formed at the beginning of the titration, but as the alcohol becomes more dilute, by the addition of the aqueous oxalic acid, this redissolves and there is no trouble in ascertaining the end of the titration, the yellow color succeeding the red sharply.

Iodine-absorption represents the percentage of iodine absorbed by

the oil when treated with alcoholic solution of iodine and mercuric chloride. The test was strictly applied as given in Allen.

Fusing point of the fatty acids obtained by using thin glass tubes closed at one end and charged with about 1 cm. of the fused acid by heating the tube and holding below the surface of the acid, as the tube cools the acid rises; by inverting the tube and tapping it the acid will flow to the bottom, and now by a little clever management the acid can be divided in two parts, separated by an air bubble; the tube is then set aside for a few hours at a temperature below the solidifying point of the fat. To take the fusing point, the little tube is attached to a thermometer and placed in a beaker of water, which, in turn, is placed in another beaker of water, and heat applied to the latter by placing on a hot iron plate. The temperature indicated when the two portions of the acid run together is that figure given first, the second figure representing the temperature when the fused acids become transparent. Under the head "Standard" are given such results as have been constantly obtained in the examination of pure oils (all European), and hence used for comparison.

Some of the above tests were also made with a so-called salad oil, a mixture of arachis and sesame oils, and with cotton-seed oil.

From the results of all of the tests would appear the purity of all the olive oils examined; the California oils differing from the foreign oils decidedly in some of the accepted tests of purity, it may be well to mention these in detail.

1. A high specific gravity; L. Archbutt, in 89 samples examined found few oils to reach 0.917, his variations are stated between 0.9136 and 0.917; the U. S. P. and Pharm. Germ. adopted 0.915 to 0.918; if the presence of free acid is considered in the California oils the specific gravities found are exceptionally high, the presence of free acid reducing the specific gravity considerably.

2. Intenser reactions with the acids; these tests should not be relied upon too implicitly for two reasons; firstly, pure oils when fresh may be affected but little by acids, but after a time may be affected considerably; secondly, the oils used as adulterants which at one time gave unmistakable color reactions are now so fully purified as to give little reaction with these same tests; of eight samples of cotton-seed oil examined no two gave like reactions with the acids.

3. The elaidin-reaction requires a longer time than with the European oils.

Olive Oils.	Color.	Specific gr. at 15·5 °C.	H_2SO_4.		HNO_3.	Ag NO_3.		Au Cl_3.
			Before stirring	After stirring.		After 15 minutes.	After 1 hour.	After 20 min.
Standard	Colorless to light yellow or green.	0·9136–0·917	Yellow, green or pale br'n.	Light brown or olive gr'n.	Colorless, yellowish, or greenish.	Should give no	dark precipitate.	No change.
American Oils.								
Kimball	Yellow tinge.	0·91747	Yellowish brown.	Dark brown.	Brownish.	Slightly green.	Greenish solid.	Ppt. of gold.
Cooper, First pressing.....	Faintly yellow.	0·91797	Yellowish green.	Brown.	Light brown,	Brown.	D'k gray brown, viscid.	Ppt. of gold.
Cooper, Second pressing	Golden yellow.	0.91767	Green.	Brown.	Light brown.	Green.	Greenish solid.	No change.
Foreign Oils.								
Mottet	Golden yellow.	0·91510	Yellowish green.	Olive.	Light yellow.	Green.	Greenish, viscid.	No change.
Rae, finest Subl.	Golden yellow.	0·91718	Green.	Olive.	Yellow.	Green.	Green, viscid.	No change.
Rae, Sublime....	Green.	0·91696	Brown.	Dark brown.	Light brown.	Green.	Green, viscid.	Purple color.
Lucca	Golden yellow.	0·91554	Yellowish brown.	Brown.	Light yellow.	Green.	Green, viscid.	No change.
Other Oils.								
Salad..... ...	Yellow tinge.	.....	Red.	Light red brown.	Red brown.	First a red color, then green ppt.	Gray bl'ck, thick.	Red color.
Cotton-seed	Golden yellow.	0·92303	Yellowish red	Light red brown.	Red brown.	Dark brown ppt.	Green, viscid; d'k brown ppt. on sides of test tube.	Red color.

Olive Oils.	Elaidin-Reaction.	Temperature Turbidity, °C.	Iodine Absorption.	Saponification Equivalent.	Free Acid.	Melting point of fatty acids.
Standard.....	Pale yellow, or almost white. Solid in less than two hours	Green, 85° Yellow, 111°	P. ct. 81–85	285–296	Per cent. Should be trifling.	23–28°C. the extremes.
American Oils.						
Kimball.....	Pale yellow. Solid in 2½ or 3 hours.	58°	88·27	295·1	8·33	21–23
Cooper, First Pressing.....		81°	88·69	294·2	1·51	20–22
Cooper, Second Pressing.		73°	88·09	295·3	2·96	19–22
Foreign Oils.						
Mottet	Pale yellow. Solid in two hours.	85°	80·13	294·2	0·97	26–28
Rae, Finest Sublime		79°	81·31	291·7	0·69	25·5–27
Rae, Sublime.		84°	83·45	292·0	1·09	25–27
Lucca		86°	85·88	292·5	1·09	25–26
Other Oils.						
Salad	Yellow fluid, with very slight deposit.	69°	104·51	294·5	2·92	30–32
Cotton-seed....		82°	.....	286·5	0·14	36–38

4. A higher percentage of free acid; to this is due the discordant figures gotten for the temperature-turbidity, but by an examination of these figures it appears that every per cent. of free acid in the oil reduces the temperature about 3° C.; if such a correction be made, figures near 85 are gotten.

5. A higher iodine-absorption for the native oil; this is very probably due to the presence of more olein than in the European oils, the melting point of the fatty acids also indicating this. There is another instance known, similar to this one, in which it has been proven that American fats differ in important respects from the same European fats; refererence is made to lard. American lard has an iodine-absorption of from 60 to 62 per cent., English lard from 51.5 to 62 per cent. (AM. JOUR. OF PHARM., 1888, 574 and 578.) From such results it would appear that climate and soil modify considerably the composition of the fats and oils, and for such variations due allowance must be made.

6. The fatty acids of the American oils at a temperature of 20° C. are viscid fluids containing suspended the higher melting acids; the European oils are solid at this temperature. Under the microscope,

the former shows the same structure, long prisms, but the European oils differ considerably in appearance—a globular form predominating; they all polarize light.

For the examination of olive oil, the specific gravity, elaidin-reaction, iodine-absorption and fusing point of the fatty acids should be considered; in an adulterated oil all of these tests will tend to confirm the adulteration and will give valuable clues to the nature of the adulterant.

EXPRESSED OIL OF ALMONDS.

By George M. Beringer, Ph. G.

Read at the Pharmaceutical Meeting, April 16.

The examination of a number of samples of oil of almonds was undertaken by the writer with a two-fold object in view; first, to determine the purity of the commercial oils, and, secondly, to satisfy myself as to the value of the requirements and tests of the United States and German Pharmacopœias. The samples of oil examined were obtained from prominent dealers in New York and Philadelphia (most of them being samples of products offered for sale), and as received they varied in amount from two fluid drachms in one case, to a pint in several. The oils examined are believed to represent those now in the market.

For comparison, samples of pure oil were prepared by extracting bitter and sweet almonds with petroleum ether. The bitter yielded 46 per cent.; the sweet 50 per cent. It was intended also to prepare a sample of peach-kernel oil, but I could not at this time procure the kernels. I regret that the samples in most cases were so small that they were insufficient to permit of the application of a number of tests.

Specific Gravity.—The U. S. Pharmacopœia states the specific gravity at ·914 to ·920. The German Pharmacopœia as ·915 to ·920. The British Pharmacopœia is silent as to specific gravity, and gives, likewise, no tests. Watts' dictionary quotes Cloëz as authority for its statement of ·91844. Gmelin, vol. xvii., 92, gives the following: ·911 (Brandes); ·917 (Brisson); ·918 at 15° (Schübler). Allen (Commercial Organic Analysis, vol. ii) states the specific gravity as ·914 to ·918. Brannt (Animal and Vegetable Fats and Oils) places it at ·917 at 68° F., and ·919 at 59° F. Bornemann (Die fetten Oele) gives ·917 to ·920 at 15° C.

The specific gravities of the samples were carefully taken at 60° F.,

using, where the sample permitted, a 50-gm. bottle; where the sample was small a 10-gm. bottle was used.

The following table exhibits the gravities and physical characters of the samples:

	Sp.Gr.	Color.	Odor and Taste.
1....	.9172...	Pale yellow, nearly colorless.	Bland, mild nutty.
2....	.9195...	Bright yellow.....	Very marked nutty flavor.
3....	.91855.	Very light yellow..... ...	Bland, mild nutty.
4....	.9191..	Light yellow.....	Bland, mild nutty.
5....	.92195.	Light yellow.....	Decidedly nutty.
6....	.9165...	Pale yellow.....	Bland, mild nutty.
7....	.9207...	Light yellow.....	Mild nutty.
8....	.9198...	Bright yellow.....	Decidedly nutty.
9....	.....	Pale yellow.....	Bland, faint nutty.
10. ..	.9220...	Light yellow.....	Faint nutty, bland.
11....	9186...	Pale yellow, nearly colorless.	Bland, hardly nutty.
12....	.9181...	Light yellow.....	Slight nutty, evidently expressed from moist almonds, as the odor of vol. oil is perceptible.
13....	.9167...	Yellow.....	Extracted from bitter almonds by petroleum ether, hardly nutty.
14....	9169 ..	Yellow.....	Extracted from sweet almonds by petroleum ether, hardly nutty.

As from the tests, numbers 1, 3 and 12 of the commercial samples are believed to be pure, and with numbers 13 and 14 prepared by myself, showing a range of gravity from .9167 to.9185, it is believed that the officinal limit might be still further narrowed by fixing the gravity at .916 to .919 and usually about ·918.

Solubility.—Considerable discrepancy exists in the various statements regarding the solubility. The U. S. Pharmacopœia describes almond oil as slightly soluble in alcohol. Gmelin's Chemistry (vol. xvii, 93) states "almond oil dissolves in about 25 parts of cold and 6 parts of hot alcohol, (Pfaff); according to Brande it dissolves very slightly in alcohol of 0.82 sp. gr. Storer's Dictionary of Solubilities says, "soluble in 25 parts of cold and 6 parts of boiling alcohol. 1000 drops of alcohol of .823 dissolve 3 drops of it at 12.5° (Schubarth's Tech. Chem.)." Allen (Commercial Organic Analysis, vol. II) says "soluble in 6 parts of boiling and 24 parts of cold alcohol." Brannt (Animal and Vegetable Fats & Oils) states "soluble in 60 parts of cold and 15 parts of boiling alcohol." The earlier editions of the National Dispensatory stated "soluble in about 30 parts of absolute alcohol," which statement, although probably correct, has been omitted in the recent editions. My own experiments lead to the

following statement: On mixing one part of oil of almonds with four parts of absolute alcohol and immersing the test tube in the water-bath a perfectly clear solution is obtained. It required 34 parts of cold absolute alcohol at the temperature of the atmosphere (about 70° F.) to make a perfect solution. With alcohol of .820 sp. gr., 42 parts were required to make a solution at the boiling point.

Color Reactions.—The U. S. P. gives only the reaction with sulphuric acid. While this test may serve to indicate the adulteration with cottonseed, sesame, peanut, rape and poppy oils, it would not indicate the admixture of lard or olive oils or the entire sophistication by peach or apricot kernel oils. The Ger. Ph. introduces the following test "when 15 parts of the oil are thoroughly shaken with a mixture of 2 parts of water and 3 parts of fuming nitric acid, a whitish mixture free from red or brown color should be formed which should separate after several hours into a firm white mass and a nearly colorless liquid. This test will serve to indicate adulterations with peach kernel, apricot kernel, sesame, and peanut oil if present in considerable quantity.

The reaction with an equal volume of hydrochloric acid and a fragment of sugar is a very delicate test for sesame oil, the acid liquid separating of a bright red color gradually assuming a purplish tint.

While testing these oils with this test it was observed by the writer that on agitating several of the samples with an equal volume of pure hydrochloric acid (sp. gr. 1.2) the oil became white and the acid separated assuming in a few minutes a bright emerald green color. Thinking that this might possibly be due to some metallic impurities in the oil the acid liquid was separated and tested for metals with a negative result. A number of pure oils were examined to determine the cause of the reaction, but none of them would give similar results. Various mixtures of pure oils were tried and from these the conclusion was derived that the reaction noted was due to a mixture of arachis and sesame oils. Pure arachis oil gives no reaction with hydrochloric acid, while sesame oil gradually assumes a reddish color and the acid becoming also of a faint reddish tint. That a mixture of these oils should produce this reaction has I believe not before been observed. Oxygen seems to be necessary to the reaction and it is noticeable that with rancid oils the reaction is more distinct.

The following table exhibits the color reactions of the oils and also the iodine absorptions.

Oil.	U. S. P. Test. 2 drops H_2SO_4 on 8 drops of oil.	Ger. Ph. Test. 15 parts of Oil, 2 parts H_2O, 3 parts HNO_3 fuming.	⅓ vol. HNO_3 (1.42.)	HCl + sugar	HCl 1.20.	*Iodine Absorption.
N.o. 1.	Yellow, outer edge becoming green, on stirring grayish, almost colorless.	White mixture. In 24 hours oil almost solid white mass, acid liquid colorless.	White, acid colorless	No change.	No change.	96.646
" 2.	Bright brown, turning to reddish brown, on stirring dirty olive brown.	Yellow mixture. In 24 hours oil in two layers, a partly congealed mass, and liq. layer on top, acid bright orange.	Greenish, turning to yellow, acid orange	Red.	Green.	106.260
" 3.	Bright yellow outer edge greenish, on stirring becoming gray, almost colorless.	White mixture. In 24 hours oil almost solid, acid liquid colorless.	White, acid colorless	No change.	No change.	99.176
" 4.	Yellow, on stirring gray, almost colorless.	Peach blossom red. In 24 hours oil partly solidified, acid liquid colorless.	Peach red, acid colorless.	No change.	No change.	99.935
" 5.	Dark brown with black spots, outer edge green, stirring dark olive brown.	Mixture white. After 24 hours oil not solidified, yellow, acid yellow.	Greenish, changing to yellow, acid yellow.	Red.	Green.	106.766
" 6.	Bright orange, on stirring almost colorless.	Peach blossom red. In 24 hours oil almost entirely solidified, white, acid colorless.	Peach red, acid colorless.	No change.	No change.	98.417
" 7.	Brownish yellow, becoming green on outer margin and red through centre, stirring dirty olive.	Reddish, changing to orange. In 24 hours oil yellow, not solidified, acid colorless.	Yellow, acid yellow.	Red.	Green.	106.480
" 8.	Dark red-brown, on stirring an olive brown tint.	Orange mixture. In 24 hours oil yellow, not solidified, acid yellow.	Greenish, changing to yellow, acid yellow.	Red.	Green.	109.802
" 9.	Yellow, outer edge greenish, stirring colorless.	Peach blossom red. In 24 hours oil solidified, acid liquid colorless.	Peach red, colorless.	No change.	No change.	93.989
" 10.	Yellow, becoming darker, on stirring light gray with dark spots.	Yellow. In 24 hours oil yellow, not congealed, acid pale yellowish tint.	Orange red, acid colorless.	Orange.	No change.	105 874
" 11.	Yellow, on stirring gray.	White mixture. In 24 hours oil solid, cream white, acid colorless.	White, acid colorless	No change.	No change.	91.586
" 12.	Yellow, stirring almost colorless.	White mixture. In 24 hours almost solid, acid, colorless.	White, acid colorless	No change.	No change.	96 646
" 13.	Bitter almond, yellow, tinged with green on outer edge, on stirring grayish, yellow tint.	White mixture. In 24 hours solid, acid colorless.	White, acid colorless	No change.	No change.	{97 152 / 98.037} av'ge 97.594
" 14.	Sweet almond, yellow, on stirring bluish gray.	White mixture. In 24 hours almost solid, acid liquid colorless.	White, acid colorless	No change.	No change.	{98.928 / 96.646 / 97.658} 97.744

*I am indebted to my friend, Mr. Wm. Beam, for his assistance in taking the iodine equivalents of these oils.

Sample number eleven on heating in a test tube gave the distinctive odor of lard oil, and this will account for its low iodine number.

Of the twelve samples of commercial oil but three answer the requirements of a pure oil; three appear to be peach kernel oil, four are mixtures of sesame and arachis oils, one a mixture of almond and lard oils, and one a purified arachis oil.

ON REFINED TAR OF COMMERCE.

By Clement B. Lowe, Ph. G., M. D.

Read at the Pharmaceutical Meeting, April 16.

Mr. McIntyre called the attention of the January Scientific Meeting to the subject of a "Steam Refined Tar," put up by James Good & Co. of this city. He stated that it differed considerably from the tar formerly on the market, and did not make a satisfactory ointment of tar.

I procured a can of the tar in question. On opening it, it was found to contain a considerable quantity of a brown colored water floating upon the tar, which I at first thought might be condensed steam, introduced in the refining process. The tar flowed quite freely, being less viscous than that formerly on the market, and also of a lighter brown color, not granular, but transparent in small quantities, and soluble in alcohol with but little residue, thus excluding the presence of coal tar in any large amount.

I called upon the manufacturers with reference to it, and learned the following particulars:

The tar comes from North Carolina in barrels; when it reaches the factory it is strained through two sieves of different fineness to remove the pine cones, sticks, dirt, etc., which are always present, owing to the carelessness of manufacture; occasionally a barrel will be half filled with a tarry clay. The tar is received into a wooden vat which contains a coil of steam pipe. After running from 100 to 150 barrels of tar through the sieves, about a barrel of sand, etc., will accumulate at the bottom of the vat and will have to be removed. It was distinctly stated, (and I believe the statement to be true) that there were no openings in the steam pipe contained in the vat, the only use made of it being to liquefy the tar so that it can be easily run into the cans.

Mr. Good explained the presence of the water found in the barrels of tar, by saying that frequently the barrels after being filled in North Carolina are rolled into the creeks to swell the staves, that then some

of the tar leaks out, and the water takes its place. He also stated that at ordinary temperatures the tar and water in the vat would remain mixed, but at the temperature to which they are heated, which is below the point at which the oil of tar would be driven off, they separate and the water rises to the top. No coal tar is added, its cost being equal to, or greater than that of tar, and its presence being easily detected by taste and smell.

The color of tar varies; at different times of the year it seems to run lighter in color and thinner. The amber tar is preferred by some, especially the manilla rope manufacturers.

Mr. Good seems to think that the tar which he is supplying is of a better quality than that formerly on the market. I suggested to him that his label was misleading and that it would be better to change it to "tar refined by steam heat."

In an interview since had with Mr. Edwin H. Rowley, who has been for many years one of the largest dealers in tar and its products in this city. he states that the color of the tar depends altogether upon the mode of its manufacture. When the drafts are so shut off that the combustion proceeds slowly, then the tar resulting therefrom will be of an amber color, of less density, and contain more oil of tar. But if the combustion is forced the wood will be carbonized to a greater extent, and the tar will be of a darker color and thicker. He considers the amber-colored tar of superior value. In distilling the oil from the tar, water first comes over, then the oil of tar which is collected and sold under the name of spirits of tar, and finally a product which is very thick, oily, and chills easily, for which there is little sale. He states that much of the oil of tar on the market is a solution of tar in rosin oil naphtha, and should not be used for medicinal purposes.

Mr. R. also stated that the presence of water in the barrels of tar originates from want of care in manufacturing the tar and filling the barrels. The tar produced by the slow combustion of the wood runs into a shallow ditch which leads into a pit dug in the sand; there it often remains uncovered, and exposed to storms; when the barrels are filled but little care is taken to separate the water. When a barrel containing tar is placed in the water, the staves swell so that the tar cannot get out or the water in. Large quantities of tar are brought from Wilmington, N. C., upon lumber rafts, the lower tier of the barrels being often partly under water, thus causing to some extent the popular impression.

CLEANING OF MORTARS AND GRADUATES.

By Hans M. Wilder.

Read at the Pharmaceutical Meeting, April 16th.

Mr. Meyer's remarks at the last meeting, about the mischief occasionally caused by using mortars which have been imperfectly cleaned, makes me think that a "wrinkle" I was taught in my apprenticeship days may be of use, especially to my younger colleagues. When I have cleaned my graduates, mortars, etc., thoroughly—at least judging from the appearance—I am in the habit of catching the last drop of the final rinsing water on my tongue, and also taking a strong sniff. In this way the last trace of any acrid, bitter or odorous substance is easily detected, in which case, of course, the washing or rinsing is continued. If substances with marked chemical reactions have been in the graduates or mortars (for instance salicylic acid, tannin, iron compounds, etc.), I use a few drops of an appropriate reagent in order to make sure of the absence of even traces. When cleaning the scale-pan, used in weighing out aniline colors, I always apply at the very last, a few drops of alcohol to the apparently thoroughly clean pan, when the merest speck of aniline color present will reveal itself instantly.

The idea of keeping separate mortars and utensils for poisons, strongly odorous and bitter substances is a good one, provided the utensils be marked unmistakably and kept in a separate place. In my store I was in the habit of keeping separate graduates for tinctures of valerian, asafœtida and spirit of peppermint, which graduates were put behind the respective shelf bottles on a small tray or a piece of hatter's felt.

BISMUTH OXYIODIDE.

By Frank X. Moerk, Ph. G.

The last issue of the American Journal of Pharmacy contains the thesis of Mr. Chas. E. Greene upon the subject "Bismuthyl Iodide," in which said writer comments upon two papers published by me. Regarding these comments, answer could be made, but, in view of the fact that the Am. Jour. of Pharm., 1888, 385, contains a third article by me in which after the first two papers "touched the extremes" I must have covered "the happy medium," there can be no object in replying. This last paper is entirely ignored by Mr. Greene, although it certainly would have been of value to him

not only for the preparation of the oxyiodide but also for the composition of bismuth subnitrate.

I have examined the process of Mr. Greene and will call attention to a few points: In making his calculations, the formula for the subnitrate is given as $BiONO_3H_2O$. As the commercial salt invariably contains bismuth oxide, the solution in nitric acid will contain more $Bi(NO_3)_3$ than can be decomposed by the KI used, hence, should the product require all of the KI there is danger of oxynitrate being precipitated with the oxyiodide. Again, the free nitric acid will under the most favorable conditions keep in solution considerable bismuth nitrate, possibly the above excessive amount; under unfavorable conditions iodine may be liberated and thus loss entailed in either case.

In following his directions, after the addition of the KI solution to the diluted bismuth solution, and warming the evolution of iodine vapors occurred, on immersing a thermometer the temperature 60° C. was registered. A second experiment confirmed this; the temperature given in the paper is 80-85°. If this decomposition takes place the product is washed with difficulty, the filtrate contains considerable bismuth and iodine. To obtain a specimen for analysis which was not decomposed by excessive heat, another trial was made and this time the temperature kept at 50° for ten minutes; after no further change in color could be noticed, it was filtered, washed, dried and weighed.

The yield was above the theoretical quantity, being 102.1 per cent. instead of 100. The filtrate gave only a cloudiness with $AgNO_3$, but a very decided precipitate with KOH. The preparation, compared with my own, was of almost the same color, a trifle more red, and was, as expected, a little bulkier; on ignition it left 66.80 per cent. Bi_2O_3, pure BiOI should leave 66.36 per cent., which would indicate the following composition: oxyiodide, 97.05 per cent., oxynitrate, 2.95 per. cent. Owing to the variable nature of the subnitrate, there can be no process devised which will require the exact amounts of subnitrate and potassium iodide, hence, in all cases there must be an excess either of the subnitrate or the potassium iodide; the latter is preferred by me because it will prevent contamination with subnitrate, and allow one to test the completeness of the washing of the oxyiodide. The nitric acid used in my process is so slight after the saturation of the Bi_2O_3 that it will not decompose the slight excess of KI.

It is possible to alter this process so as to include precipitation, by dissolving the subnitrate in nitric acid, diluting largely with water, adding the potassium iodide in dilute solution, adding now sufficient solution of soda so as to leave only a slight acid reaction, and then boiling for one half hour; the boiling is essential, as moderate warming will not complete the reaction. The advantages of this more complicated process are, however, not sufficient to discard the simpler process.

GERANIUM MACULATUM.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.—No. 51.

By Henry J. Mayers, Ph. G.

The object in investigating this drug was to ascertain the proximate constituents and determine if it, as has been stated, contains so much as 17 per cent. tannin.

Dr. Edward Staples (A. J. P., 1829, p. 171) found tannic and gallic acids, red coloring, resin, mucilage and a crystallizable vegetable principle.

H. K. Bowman (A. J. P., 1869, p. 193) obtained from two samples 13·41 and 17·25 per cent. of tannin respectively.

For the quantitative analysis the drug was procured from a reliable source in fine powder, and 50 grams taken for the first extractions.

I. Treatment with Petroleum Ether.—This solvent extracted 0·228 per cent.; wax and fat, 0·210 per cent.; volatile oil, a trace.

The wax and fatty matter were of a yellow color, solid at ordinary temperatures, melted at 60° C. Soluble in stronger ether, chloroform and hot 95 per cent. alcohol; the last solvent deposited the wax on cooling, which was of a white color and not crystallizable.

II. Treatment with Stronger Ether.—The drug freed from the previous solvent was exhausted with successive portions of stronger ether.

Total amount dissolved, 0·46 per cent.; resin soluble in alcohol, 0·25 per cent.; gallic acid, 0·21 per cent.

The resin was of a dark brown color and a bitter taste.

The ethereal extract was evaporated and treated with water, the resin separated by filtration and the aqueous filtrate agitated with ether. On separating the ethereal layer and setting aside for 24 hours, crys-

tals of gallic acid of a yellowish color were found to cover the bottom of the beaker. The solution of these crystals in hot water gave no reaction with pure ferrous sulphate, a blue-black precipitate with ferric chloride, no precipitate with tartar emetic or gelatin, and a green color with potassium hydrate changed to red by acids; no tannin was found in the ethereal extract.

III. Treatment with Absolute Alcohol.—Total amount extracted, 11·40 per cent.; tannin, 2·48 per cent.; decomposed tannin (phlobaphene), 8·92 per cent.; small amounts of sugar and a crystalline principle not estimated.

The aqueous solution of the alcoholic extract gave the following reactions: Solution of ferric chloride, blue-black precipitate; solution of ferrous sulphate, no change; solution of tartar emetic, dark precipitate; solution of gelatin, white flocculent precipitate.

Definite portions of this aqueous solution gave with lead acetate and copper acetate almost exactly the same amount of tannin—2·48 per cent. Petroleum ether and ether extracted from this aqueous solution, made alkaline, a small quantity of a white crystalline body soluble in stronger ether, from which it was recrystallized. This is probably the "crystallizable vegetable principle" mentioned by Staples.

IV. Treatment with Distilled Water.—Total amount dissolved, 9·54 per cent.; mucilage, 1·12 per cent.; dextrin, 2·58 per cent.; sugar, 5·84 per cent.

V. Treatment with Dilute Alkaline Solution.—Total, 7·52 per cent.; mucilage, 4·64 per cent.; albuminoids, 2·88 per cent.

Dilute acid and chlorine water extracted small quantities, which left, after deducting ash, 57·09 per cent. of cellulose. In separate portions of the drug the moisture was found to be 5·02 per cent., the ash 8·75 per cent.

The amount of tannin found was so low as to demand verifying, which was undertaken by exhausting 10 grams of the drug with boiling water. This decoction, with gelatin and alum solution, indicated 4·25 per cent. This discrepancy not being satisfactory, another portion of the whole drug was purchased, and powdered. In this lot, by the gelatin and alum process, 11·53 per cent. were obtained. These differences in the amount of tannin may be explained by supposing that the two lots of drug were collected at different times in the year, or the first lot, coming from stock kept in the powdered state, had changed; the quantity of phlobaphene, as may be noticed, being excessive.

RESIN FROM FLOWER BUDS OF POPULUS TREMULOIDES.

By Robert Glenk.

On macerating the coarsely-cut fresh buds with alcohol, a dark amber-colored tincture was obtained, which on concentration by evaporation and pouring into water precipitated a yellowish brown resin with a strong hop-like odor, and melting at 51°C.

It is soluble in glacial acetic acid, acetic ether and amyl alcohol; only slightly soluble in chloroform, ether, carbon disulphide, turpentine and benzol.

In alcoholic solution it has an acid reaction. On adding 1 drop of tincture of chloride of iron to 3 cc. of an alcoholic solution (1–50), a dark green color is produced, and the addition of a solution of chlorinated soda to the alcoholic solution produces a jet black color. It is completely soluble in KOH, 5 per cent., to a brown red solution, and is reprecipitated on the addition of an excess of acid. On oxidizing the solution in 2 per cent. caustic potash a peculiar play of colors was noticed from an emerald to a dark green, then to violet, and after five minutes to a deep carmine red, with a distinct odor of oil of bitter almonds, (due probably to cinnamic acid or some anthracene derivatives).

The resin is not entirely soluble in an excess of water of ammonia even on warming; on filtering and evaporating the filtrate, part of the resin is reprecipitated, while a portion remains soluble in water, and on addition of a neutral solution of ferric chloride to the aqueous solution a brown precipitate is produced which on addition of dilute hydrochloric acid is changed to a light yellow color.

On adding to 1 grain of the powdered resin 1 cc. of fuming nitric acid, a dark green solution is formed, afterward changing to dark brown, reprecipitated on adding water. With H_2SO_4 specific gravity, 1.82, a dark red solution is formed which is precipitated on adding water. With HCl specific gravity, 1.160, no change; and with a solution of bromine in chloroform (1-20) no change was observed.

Heated on platinum foil the resin burns and leaves but a minute residue of Na_2CO_3.

Picrotoxin is recommended as an antidote for morphine by Prof. A. Bokai (*Internat. Klin. Rndsch.* Jan., 1889). It is a powerful stimulant to the vaso-motor centre, and may reduce the danger of asphyxia in chloroform narcosis if a small dose be previously administered.

ON TINCTURES.

Abstracts from Theses.

Tinctura Cantharidis.—Rob. A. Hatcher proposes maceration for preparing this tincture. He found that if prepared by percolation a small amount of cantharidin may remain behind in the powder, which can be extracted by the process of Mortreux, viz.: exhausting with chloroform, treating the extract with carbon disulphide, and crystallizing the undissolved portion from chloroform.

Tinctura Catechu composita.—F. B. Quackenbush observed a difficulty in percolating the mixed powders of catechu and cinnamon; if much finer than No. 40, as directed by the Pharmacopœia, the powder would form a solid cake which could not be properly exhausted with the requisite menstruum. This was, however, accomplished by passing the powder through a sieve several times while moistening it.

Tinctura Ferri chloridi.—Griffith R. Lewis again directs attention to the reducing action of alcohol upon ferric chloride, and suggests that the alcohol be replaced by water as previously suggested by Professor Attfield. The generation of ferrous salt was shown qualitatively, no quantitative determinations having been made.

Tinctura Kino was found by F. B. Quackenbush to filter very slowly if prepared according to pharmacopœial directions; but after prolonging the maceration to five days, the subsequent filtration was accomplished in less than one-fourth the time.

Tinctura Nucis Vomicæ.—Of twelve samples of this tincture examined by Edmund H. Watkins, one was whitish and opaque; two were of a distinct reddish tint, while the others varied from a light yellow to dark yellow. The percentage of extract obtained on evaporation was $\frac{3}{4}$, $1\frac{1}{2}$, 2 (three samples), $2\frac{1}{4}$ (two samples), $2\frac{1}{2}$ (two samples), $2\frac{3}{4}$, 3 and $3\frac{3}{4}$. The alcoholic strength of the menstruum was not determined, nor was it ascertained whether the extracts corresponded with that of the Pharmacopœia.

Tinctura Opii.—Arthur M. Leine examined twelve samples, by evaporating the alcohol, shaking with ether, filtering, precipitating with ammonia, washing with ether and drying. One sample obtained from a country grocery store, yielded only ·28 per cent. of morphine. The remaining samples yielded respectively 1·4, 1·2, ·96, ·80, ·76, ·70, ·68, ·65, ·60, ·54 and ·46 per cent. of morphine. The

weakest samples appear to have been made of half strength for the purpose of retailing.

Tinctura Opii deodorata.—Wm. H. S. Bateman proposes a modification of the pharmacopœial process as follows: Percolate powdered opium, 10 parts, with stronger ether 28 parts; dry the powder; digest it for two hours at 175° F. (80° C.) with water 40 parts; repeat this operation twice; mix the expressed liquids, evaporate to 60 parts; filter; wash the filter with water to obtain 80 parts of filtrate and add alcohol 20 parts.

Tinctura Scillæ produces a precipitate which may be prevented, according to F. B. Quackenbush, by putting quite a quantity of cotton in the neck of the percolator.

Tinctura Vanillae.—The labor of powdering the vanilla is much lessened by the use of a small proportion of coarse sand previously sifted and washed. F. B. Quackenbush believes that maceration brings out the flavor better than percolation, and that the longer the maceration proceeds, the more delicate will be the aroma of the tincture.

ABSTRACTS FROM THE FRENCH JOURNALS.

Translated for the AMERICAN JOURNAL OF PHARMACY.

THE USE OF COLD IN THE PREPARATION OF EXTRACTS.—In a communication to the *Société Chimique*, M. Adrian describes his process, which may be stated as follows: The ordinary vegetable preparation (maceration or decoction) is filtered with pressure and placed in a cooling machine where it is subjected to a temperature of —10° C., [+14° F.]. The congealed blocks are then crushed and placed in a rapidly acting essorage apparatus which separates, in a solid state, about 75 per cent. of the water, deprived of nearly all of its soluble principles. The fluid extract thus obtained is again congealed at a lower temperature and the rest of the previous process repeated. The product consists of a highly concentrated syrupy extract equal to 12 to 15 per cent. of the original liquid, which may now be evaporated to any desired degree *in vacuo*. These extracts are not so dark in color as those made by the usual processes, they give clearer solutions, and they present in the highest degree the organaleptic character of the substances which have furnished them. The editor of *L' Union Pharm.* (*March*) from which these details are taken,

will soon present the results of experiments and analyses made upon extracts made by this process.[1]

EXALGINE OR ORTHOMETHYLACETANILIDE.—Messrs. Dujardin-Beaumetz and Bardet find that the effects of this substance bear a strong resemblance to those obtained from antipyrine; but exalgine acts more decidedly upon the sensibility and less upon the nervous centres. Therapeutically, the analgesic effects of exalgine may be obtained in single doses of 25 cgm. to 40 cgm; or, from 40 cgm. to 75 cgm. may be taken daily in two doses. The analgesic action appears to be superior to that obtained from antipyrine, even in all forms of neuralgia, visceral neuralgia included. We have not observed, say the authors, any gastric or intestinal irritation, rash or cyanosis as following its use. Exalgine is eliminated by the kidneys and diminishes the amount of sugar in the urine. It is antiseptic, antithermic and analgesic, the latter action predominating. *Nouv. Rem.*, March 24

SALICYLATES OF THE CRESOLS.—These salts may be prepared from ortho, meta or para cresol by a process similar to that used in the making of salol. They are insoluble in water, slightly soluble in cold alcohol, and are easily crystallized. M. Nencki states that they decompose in the economy, where they exert an antiseptic power equal to that of salol, without producing toxic effects. M. Sahli is quoted as saying: "When a considerable dose of antiseptic substance is to be introduced into the digestive tract, the salicylates of ortho or para cresol should have the preference over salol." The same writer prefers these salts to salol in articular rheumatism and vesical maladies. —*Comptes rend.*, Feb. 4; *Répert. de Phar.*, March 10.

DOSES OF SULPHONAL.—In a long study of sulphonal, *Bull. gén. de Thérap.*, March 15, M. Egasse gives the doses as follows: For children, 15 to 25 cgm., two hours before bed-time. For women, 1 to 2 gm.; and for men, 2 to 5 gm., daily, either fractionally, or, as seems preferable, in massive doses, given during a meal, or two hours before the hour for sleep. It is best given, finely pulverized, in capsules, but may be held for some time in suspension in dense mucilaginous mixtures. It may also be given in wine or milk.

[1] The process of preparing extracts by cold was described by Professor Alfonso Herrera of Mexico, in AMER. JOUR. PHAR. 1877 pp. 437–440. Mr. Adrian's improvements consist in the use of a centrifugal apparatus for separating the concentrated solution from the ice, and in finally evaporating in vacuo. Prof. Herrera propose l such preparations to be called opopycnols.—Editor.

THEINE USED HYPODERMICALLY.—In chronic neuralgia and rheumatism, Dr. F. J. Mays prescribes theine in hypodermic injections of doses varying from 2 to 6 cgm. He recommends the following formula: Theine and benzoate of sodium, āā 3·75 gm.; chloride of sodium, 50 cgm., aq. dest., 30 gm. Of this solution, 0·36 gm. contains 0·03 of theine.—*J. de Ph. et de Ch.*, Feb. 1.

COLLYRIA OF BORATES OF THE ALKALOIDS.—Messrs. Petit and Galezowski find these useful as preventing the local irritation often caused by the use of alkaloidal acid salts. The alkaloid, such as eserine, pilocarpine, atropine, hyoscyamine and cocaine, is first dissolved in a small quantity of alcohol. Then a quantity of boric acid equal to twice the weight of the alkaloid is dissolved in alcohol and the solutions are united. The mixture is then evaporated to dryness. An excess of boric acid is not injurious.—*Nouv. Rem.*, March 24.

ALTERATION OF MORPHINE IN AQUEOUS SOLUTION.—Dr. Lamal finds that pure salts of morphine in distilled water are unalterable if kept from the action of light and dust. Cloudy solutions arise from the development of micro-organisms. The yellow coloration, acid reaction and formation of crystals, are due to the action of light and of organic ferments. The color arises from the transformation of morphine into an amorphous substance which appears to be morphetine. The crystals are caused by oxidation of the salt. The acid reaction is due to morphetine and the salts of oxymorphine[1]. Apomorphine is not formed in aqueous solutions of morphine. In the blood and tissues, morphine is partly transformed into oxymorphine, which is eliminated by the urine; but morphine, as such, may be found there. In organic researches for morphine, oxymorphine should be sought for as a first product of oxidation.—*Bull. de l' Acad. de Belg.; J. de Ph. et de Ch.*, Feb. 15.

OLEIC ACID ADULTERATIONS.—According to Granval and Valser linoleic acid—made from linseed oil by saponification—is used commercially for this purpose. The authors state that if a thin coating of the sophisticated oil be applied to a smoothly scraped lead plate, and exposed for twelve hours to the air, it will become gummified, while pure oleic acid remains, under like circumstances, nearly unchanged. Or, a small quantity of the suspected oil may be mixed with an equal

[1] That solutions of acetate of morphine may yield crystals of morphine was shown in AMER. JOURNAL OF PHARMACY, 1871, p. 50.—EDITOR.

amount of soda-lye. If linoleic acid be present an intense yellow color is produced; if the oleic acid be pure, the reaction is of a gray color.—*Jour. de Ph. et de Chim.*, March 1.

RAISIN WINE.—M. Palangié recommends the following formula: Corinth raisins, 25k.; sugar, 4k.; fresh grapes, 1k.; tartaric acid, 25 gm. Exhaust the raisins with three waters; press and unite all the liquors in a cask. Dissolve the sugar and tartaric acid in water and boil for a few minutes; add this to the other liquors, with water to make a hectoliter; then add the grapes, previously bruised, and keep the mixture at a temperature of 77°F. In 48 hours from the beginning of fermentation the air in the cask must be renewed, and this must be repeated daily until fermentation ceases. The wine should stand for a month before bottling.—*Jour. de Phar. et de Chim.*, March 15.

PRESERVATION OF COLORED ANATOMICAL SPECIMENS.—Alcohol changes, and often destroys, the coloring matters of these objects. Mr. Fabre-Domergue proposes a syrup in accordance with the following formula: Syrup of glucose, of 25° B. (specific gravity, 1·210), 1000 gm.; white glycerin, 100 gm.; methylic alcohol, 200 gm.; camphor, q. s. The glucose is dissolved in hot water; after cooling, the other articles are added, with "a few pinches" of powdered camphor. The liquor should be neutralized with a little soda or potash lye; it should then be filtered and a little camphor should be dusted over the surface.—*Nouv. Rem.*, March 24.

GLEANINGS FROM THE GERMAN JOURNALS.

BY FRANK X. MŒRK, PH. G.

Blue litmus paper made by neutralizing an aqueous solution of litmus with phosphoric acid is liable to wrongly indicate the reaction of some solutions; the aqueous solution of litmus in addition to the potassium salt of the coloring matter contains the carbonates of potassium and ammonium, which, with phosphoric acid, form the acid salts, K_2HPO_4 and $(NH_4)_2HPO_4$, with alkaline reactions, and certain quantities of phosphoric acid can be added to solutions of these salts without the production of an acid reaction; such a paper brought in contact with *neutral* solutions of Ca, Ba, Sr and Ag invariably indicates an acid reaction due to formation of acid phosphates of these

metals, which have acid reactions, or of free phosphoric acid. To obtain a sensitive litmus paper recourse must be taken to some other mineral acid, preferably HCl. The following method furnishes litmus paper which easily indicates alkalinity, as KOH, in 1 : 20000; acidity, as HCl, 1 : 50000; 100 gms. litmus in cubes are triturated with 40 gms. water to form a paste, which is then rinsed into a flask with 960 gms. water, agitated repeatedly during six hours, allowed to stand a few days, filtered and washed with water to make 1000 gms.; to the filtrate add 5 gms. hydrochloric acid, warm on a water-bath to expel CO_2, and, in case the blue color reappears, add HCl drop by drop until a permanent red color results, evaporate to 900 gms. and divide into two portions. To one portion add lime water until the liquid becomes wine-red in color; through this solution pass strips of neutral filter paper, should the latter be acid in reaction wet with dilute ammonia water and dry; the test paper is of a wine-red color and of the above degree of sensitiveness. To the other portion add carefully, first, a few drops of solution of potash and then lime water until a strip of paper moistened with the solution on drying just appears blue. The blue paper is not changed by silver nitrate or the neutral compounds of Ba, Sr and Ca precipitated ferrous sulphate merely imparts a red-violet color; a solution of lead acetate does not affect the paper but very often this chemical will show an alkaline reaction due to loss of acetic acid.—E. Utescher, *Apoth. Ztg.*, 1889, 279.

Adeps benzoatus is best prepared by dissolving one part true sublimed benzoic acid in one hundred parts melted lard; such a preparation possesses a finer appearance, more pleasant odor, less reducing action (on salts of silver), is of uniform quality and keeps as well as the preparation made with benzoin.—E. Utescher, *Apoth. Ztg.*, 1889, 280.

Myrtle oil and myrtol have recently been examined by E. Jahns prompted by their increased use in affections of the respiratory organs and the bladder. The myrtle oil of Spanish origin (in contra distinction of a Corsican oil which is also found in commerce distinguishable by a finer odor) is of a light yellow color, is dextrogyre and has, at 10° C., the specific gravity 0·910. It commences to boil at 160° and fractioned, eighty per cent. distil over below 240°, the residue is stated to consist of resinified and polymerized terpenes. From the different fractions between 160° and 240° were isolated 1, a terpene, very probably dextrogyre-pinene, boiling at 158—160°; 2, Cineol

$C_{10}H_{18}O$ boiling at 176°, this could not be obtained pure simply by fractional distillation but by application of Wallach's method (passing dry HCl through the chilled fraction, draining the crystalline magma, decomposing this with water, warming with dilute KOH, washing the separated oil with water, drying and distilling over metallic sodium) it was obtained; 3, a camphor-like body boiling between 195 and 200° which could not be isolated perfectly pure, but its behavior towards metallic sodium and the results of an ultimate analysis point towards the formula $C_{10}H_{16}O$. The so-called *myrtol* was found to be a mixture of dextrogyre-pinene and cineol and is more appropriately called *rectified myrtle oil.* The use of myrtol is recommended to be discontinued, giving way to eucalyptol identical with cineol; the presence of the terpene and the irritating effect of this substance on the respiratory organs being the cause for the above suggestion.—*Arch. der Pharm.*, 1889, 174.

Mercurial ointment is made by G. Greuel by triturating 100 gms. mercury with 15 grams *anhydrous* lanolin, containing 20 per cent. olive oil, until the mercury is extinguished under a lense magnifying 5 diameters, and incorporating with an *anhydrous* semi-fluid mixture of 115 gms. lard and 70 gms. mutton suet. The success of the method depends upon using material entirely free from water; one kilogram ointment can be made in from one to one and a half hours. —*Pharm. Centralhalle*, 1889, 127.

Cinchona-liquor of beautiful color, pleasant bitter taste and aromatic odor is prepared as follows: Cinchona bark 600, fresh orange peel 350, fresh Curaçoa peel, free from parenchyma, 150, gentian 180, cinnamon 100, cloves 1, cardamom 0.8 are macerated with white wine 2250 and alcohol (96 per cent.) 3500; rock candy 3100 is dissolved with heat in water 1500 and, after cooling, mixed with the vinous liquid, allowed to stand two days and filtered.—Rolffs, *Pharm. Ztg.*, 1889, 166.

To remedy rancidity in oils, H. Hager uses alcohol of 85–87 per cent., which by dissolving the free fatty acids renders the oil again sweet and fit for use; one volume of the oil warmed to 35° C. is thoroughly and repeatedly agitated during twelve hours with one to one and a-quarter volumes of alcohol, allowed to separate and the upper (alcoholic) layer removed. The oil is shaken a second and, if necessary, a third time with half a volume alcohol; proceeding as above from a rancid olive oil (six to eight years old) 0·86 per cent. free

fatty acids were obtained; the alcohol can be recovered by distillation making the process a cheap one. Of a large number of oils examined, castor oil alone could not be purified in this manner, owing to its affinity for alcohol; with alcohol of more than 50 per cent. this oil increases in volume and the alcohol dissolved is removed with considerable difficulty. There are some oils in which the free fatty acids are desirable, as cod liver oil, croton oil and the fixed oil of laurel, to which the process is not applicable.—*Pharm. Ztg.*, 1889, 192.

Extractum Glycyrrhizæ.—Kremel (*Pharm. Post*, 1889, 194) states that the solubility of this preparation is not a sufficient test of purity and advises determinations of the glycyrrhizin and the ash. It has been found that the ash of the unadulterated extract is always strongly alkaline. The glycyrrhizin is estimated by taking 5 gms. coarsely powdered extract and 50 cc. water, allowing to stand for several hours with frequent stirring, adding, after solution, 50 cc. of 90 per cent. alcohol which materially assists filtration, allowing to subside and filtering through a plaited filter. The filter is well washed with 40 per cent. alcohol and the alcohol removed from the filtrate by heating on a water-bath; after cooling, the glycyrrhizin is precipitated with sulphuric acid, collected on a small filter, washed with water and dissolved off the filter by carefully dropping on ammonia water; the filtrate is collected in a small tared beaker or capsule, evaporated on a water-bath and finally dried at 100° and weighed.

	1	2	3	4	5
Glycyrrhizin	5·88	8·06	8·30	9·75	11·90
Ash	2·90	6·44	5·64	8·64	5·64

The ash of 1 was neutral in reaction and the percentage of glycyrrhizin so low as to be suspicious.

Sodium bicarbonate of English manufacture is chiefly made by the ammonia-soda process and contains ammonium salts in varying amounts; attention is called to the fact that ammonium salts interfere seriously with the mercuric chloride test for the normal carbonate, a white precipitate of mercurammonium chloride appearing first and only after fifteen to thirty minutes the red precipitate characteristic of the carbonate.—C. Arnold, *Pharm Ztg.*, 1889, 198.

Medicinal cod liver oil is examined for iodine by mixing three grams oil with two grams dry sodium carbonate, heating to complete carbonization, lixiviating with repeated small portions of boiling water, filtering, concentrating, adding five to six drops fuming nitric

acid, and shaking with carbon bisulphide. The iodine can be estimated quantitatively by using $\frac{1}{10}$ normal sodium thiosulphate solution; the averages obtained were for pale oils 0·02 per cent., for yellow oils 0·031 per cent. The acidity is determined by dissolving 2–5 grams oil in 20 cc. ether, adding 15 cc. alcohol and a few drops phenolphthalein and titrating with $\frac{1}{10}$ normal potassium hydrate; the acidity of the ether and alcohol must also be determined and allowed for in the test. The acid present in one gram oil neutralized from 0·002 to 0·0044 gram KOH. The writer recommends that only cod liver oil containing iodine, and whose acidity does not require more than 0·004 gram KOH per gram oil be employed medicinally.—Hugo Andres, *Pharm. Ztschr.* f. Russl., 1889, 145.

Mercuric salicylate can be made by precipitation as follows: Dissolve two grams mercuric oxide in acetic acid diluted with a little water by application of heat, dilute to 200 cc., add a solution of sodium salicylate (about 3·13 grams) until precipitation ceases, filter, wash precipitate with water until washings are no longer affected by H_2S or Fe_2Cl_6; yield three grams. The product is a white amorphous powder, soluble in solution of sodium chloride.—C. Goepel, *Pharm. Ztg.*, 1889, 206.

Guaiacol should constitute an oily, refractive, when freshly distilled, colorless liquid, of pleasant aromatic odor, sp. gr. 1·117 slightly soluble in water 1:1000, easily soluble in alcohol and ether. 2 cc. each of guaiacol and solution of soda (sp. gr. 1·30) evolve considerable heat when mixed, and on cooling form a white crystalline solid mass. 5 cc. guaiacol, agitated with 10 cc. glycerin (sp. gr. 1·19), should not be decreased in volume. 2 cc. guaiacol, 4 cc. benzin, and a few drops of water, cause an immediate separation of the guaiacol. An aqueous solution with Fe_2Cl_6 gives first a yellowish, afterwards a pure brown color. Three drops of guaiacol, dissolved in 5 cc. absolute alcohol, with a very dilute Fe_2Cl_6 solution, gives first a blue solution, changing at once to green.—(*Pharm. Weekbl.*), *Apoth. Ztg.*, 1889, 324.

Glucose in milk sugar.—To detect even traces, H. Will agitates for one minute 10 grams powdered milk sugar with 20 cc. dilute alcohol, filters and heats to the boiling point, for a few seconds, 5 cc. of the filtrate with 5 cc. of a solution made from 7 grams cupric acetate, 87 cc. water, and 3.2 cc. dilute acetic acid; the test, in *absence* of glucose remains clear on cooling, and after one hour's standing should show no deposit of cuprous oxide.—*Apoth. Ztg.*, 1889, 324.

Sodium salicylate solutions after a short time develop a red color, rendering them unfit for use. This decomposition takes place especially in alkaline solution; a fresh solution of sodium salicylate has a slightly acid reaction; but this reaction, especially in concentrated solutions, is destroyed, and instead an alkaline reaction appears, dependent upon which is the depth of color of the solution. S. Demant gives the following formula for a 20 per cent. solution, which remains unchanged for months; its stability is due to a slight excess of salicylic acid, which in no way interferes with its action: 400 parts distilled water are heated to the boiling point, allowed to cool to 30° C., 100 parts salicylic acid added, and then 60 parts bicarbonate of sodium introduced, in small portions, with constant stirring, the solution is filtered through absorbent cotton and diluted with sufficient distilled water to make 600 parts.—*Oesterr. Ztsch. f. Pharm.*, 1889, 171.

NOTE ON THE DECOMPOSITION OF POTASSIC CHLORATE BY HEAT IN THE PRESENCE OF MANGANIC PEROXIDE.[1]

Having observed the alteration in appearance that peroxide of manganese undergoes when heated with potassic chlorate, the author has made a number of experiments, using different kinds of oxide of manganese, determining the loss of weight that the mixture suffers when heated, and also the quantity of chlorine simultaneously generated. The heating was generally effected by the vapor of boiling mercury, at which temperature the potassic chlorate is not changed. The more finely divided the peroxide, the more rapid is the action and the more chlorine is evolved. When the evolution of chlorine is prevented by the addition of a small quantity of sodic or potassic carbonate, the decomposition of the chlorate proceeds very slowly, unless the temperature be raised much above that of boiling mercury. When potassic chlorate is fused with a minute quantity of peroxide of manganese, the residue is found to be pink on cooling, indicating the presence of a permanganate; and inasmuch as potassic permanganate is decomposed at a temperature of 275°, it is not improbable that the permanganate is decomposed by the heat as rapidly as it is produced into potassic

[1] Abstract of a paper read before the Chemical Society; reprinted from *Chemical News*, March 1, p. 104.

manganate, manganic peroxide, and oxygen; the resulting potassic manganate is acted on by chlorine generated by the action of the peroxide on some fresh chlorate, forming potassic chloride, manganic peroxide, and oxygen, so that the peroxide is being continually reproduced. The quantity of chlorine evolved corresponds to only a very small proportion of the manganic peroxide present, so if the first action really takes place the chlorine must be absorbed and employed in converting the potassium into chloride.

Discussion.—Professor Thorpe, referring to the well-known fact that no perchlorate is formed in presence of manganese dioxide, asked how this was to be explained.

Mr. Williams stated that he had been unable to obtain the theoretical amount of oxygen from potassium chlorate by heating it *in vacuo;* a gas was given off which attacked mercury—presumably chlorine, and therefore it was probable that the residue contained potassium peroxide. On heating silver iodate *in vacuo* the theoretical amount of oxygen was obtained without difficulty.

Professor McLeod said that he was unable to account for the non-production of perchlorate in presence of manganese dioxide; as potassium perchlorate was not decomposed by heating with manganese dioxide, it probably was not even an ephemeral product. He had without difficulty obtained almost the theoretical amount of oxygen from chlorate. He did not think that the pink color was due to ferrate as had been suggested, as he had found that iron oxide gave a somewhat different color.

Professor Ramsay remarked that Stas, in his determination of the ratio of potassium chloride to oxygen in chlorate, had not found that peroxide was formed.

ESTIMATION OF FREE HYDROCHLORIC ACID IN THE CONTENTS OF THE STOMACH.[1]

By J. Sjöqvist.

The oldest method is that of Bidder and Schmidt, who were the first to prove the existence of free hydrochloric acid n the gastric juice. Rabuteau's method, modified by Cahn and v. Mering (*Deut. Arch. klin. Med.*, xxxix, 239), consists in distilling off the volatile acids and shaking the residue with a large excess of ether which takes up

[1] *Zeit. physiol. Chem.*, xii., 1–11; reprinted from *Jour. Chem. Soc.*, March, 1889.

the lactic acid; this is separated, and cinchonine is added to the remainder until the reaction is neutral, then it is shaken four or five times with a large excess of chloroform, which takes up the cinchonine hydrochloride; the chloroform is distilled off, and the chlorine estimated in the residue. Another method devised by Cahn and v. Mering consists in distilling the contents of the stomach with water three times. The volatile fatty acids are estimated in the distillate. The residue is shaken six times with 500 cc. of ether, and this is evaporated to dryness, and the lactic acid estimated by titration. The residue contains the hydrochloric acid, and this also can be estimated by titration.

Another method used by Seemann (*Zeit. klin. Med.*, v), and Hebner (*Zeit. anal. Chem.*, xvii, 236), consists in neutralizing the stomach-contents by titrating with sodium hydroxide, evaporating to dryness, and carefully incinerating. The ash is extracted with water, and in the extract the alkali present is estimated by titrating with an acid; the difference between the amount of alkali added, and the amount of alkali found, gives the amount which must have combined with hydrochloric acid.

This method, however, gives too high results; and the other methods take too long, and too large a quantity of the necessary reagents to be available for clinical work.

The method now recommended gives absolutely accurate results, and is sufficiently simple to use clinically. The contents of the stomach are evaporated to dryness with barium carbonate and then incinerated; barium chloride remains unchanged, and the salts of the organic acids are burnt to barium carbonate. The barium chloride is then extracted with water, and the quantity of barium dissolved is a measure of the original amount of free hydrochloric acid. The barium may be estimated by Mohr's titration method. In this method, potassium dichromate is added to the barium solution, by which means a precipitate insoluble in water and acetic acid is formed; the indicator of the end of the reaction is the yellow color which the smallest excess of the dichromate gives to the liquid which floats over the precipitate. A more delicate test for excess of the dichromate is, however, Wurster's tetramethylparaphenylenediamine paper. Potassium dichromate in an acetic acid solution acts in the same way as ozone, to test for which the paper was originally used; it turns it blue.

The titration is carried out as follows:—The solution of barium chloride is placed in a beaker, and a quarter of its volume of alcohol added, then a few cc. of a 10 per cent. solution of sodium carbonate containing 10 per cent. of acetic acid. A standard solution of potassium dichromate is then added from a burette till the end-reaction is obtained. Directions are given for the preparation of the standard solution: the most convenient was found to be one of which each cc. corresponded to 4·05 mgrms. of HCl.

The method was tested with known strengths of hydrochloric acid, and mixtures of hydrochloric and lactic acids, and with artificial gastric juice. The results obtained were exceedingly accurate. The paper concludes with the account of the results obtained from actual stomach-contents by the use of the method. These may be summarized as follows:—

Case.	Reactions for HCl.	Reactions for lactic acid.	Percentages.	
			Total acidity.	HCl.
1	Doubtful	Well marked	0·15	0·02
2	Positive	Positive	0·29	0·132
3	"	"	—	0·076
4	"	Doubtful	0·2	0·138
5	"	Positive	0·295	0·144
6	"	Weak	0·189	0·164
7	Negative	Positive	0·14	0·03

ON AGARIC ACID.[1]

By Dr. Hofmeister.

Pure agaric acid is a bibasic triatomic homologue of the malic acid series, having the formula $C_{14}H_{27}(OH)<\begin{matrix}CO\ OH.\\CO\ OH.\end{matrix}$ Its solubility is but slight in cold, and fair in boiling water. The neutral alkaline salts dissolve readily, and, like the salts of the higher fatty acids, easily break up in solution into free acid and basic salt.

Locally its action is that of an irritant. Injected under the skin it causes intense pain, inflammation, and suppuration. When swallowed, large doses produce vomiting and diarrhœa. The general action on

[1] *Archiv für experimentelle Pharmakologie*, XXV., Hft. 2; abstract reprinted from *The Medical Chronicle*, March, 1889.

cold-blooded animals is a gradually progressive central paralysis, weakening of the heart, and suppression, or marked depression of the cutaneous secretion. The only symptoms produced in dogs by large doses administered by the mouth were vomiting and diarrhœa. By subcutaneous and intravenous injections in rabbits, it was found that the vaso-motor and vagus centres were first stimulated and finally paralyzed. Death was caused by failure of respiration, and in animals subjected to artificial respiration, by failure of the heart.

The action of agaric acid on the secretion of sweat was investigated in cats by injecting subcutaneously the soda salt. The results placed beyond a doubt the anti-hydrotic action of the drug. The facts that in an animal under the influence of agaric acid, irritation of the sub-sciatic nerve had no effect on the secretion of sweat in the corresponding leg, and that this limb sweated profusely some minutes after the injection of pilocarpin, prove that the action is not central but peripheral.

With the exception of the anti-hydrotic effect, there is no similarity between the actions of atropin and agaric acid.

Malic acid and members of the higher fatty acid series were tried, and found to have no influence on the sweat glands.

In regard to the therapeutic use of agaric acid, it is to be noted that the local irritation produced by the drug and its salts forbid the subcutaneous administrations. On the other hand, vomiting and diarrhœa need not be so dreaded when the pure drug is used as the experience of those who have tried the commercial agaricin might lead us to do.

Doses of 0·05, and in one case 0·1, given to phthisical patients caused slight temporary nausea and signs of intoxication. Doses of 0·02 and 0·03 were, without exception, well borne. The anhydrotic effect became first manifest hours after the drug was taken, and lasted for over twenty-four hours. Hence it is possible to get the full benefit of a large dose, and at the same time avoid the unpleasant effects, by repeating small doses at short intervals. The large doses should not be ventured on unless it is quite certain that we are dealing with pure, white, well-crystallized agaric acid, which does not taste bitter when dissolved in weak alcohol, and forms a colorless solution in boiling water.

Cocaine is precipitated by sodium borate, according to Levaillant; the precipitate will disappear on the addition of a few drops of glycerin.—*Archives de Ph.*, Nov. 6, 1888.

THE CONGEALING POINT OF OIL OF ANISE.[1]

By John C. Umney.

The commerce of oil of anise would seem to have changed materially since the time when the editors of the *Pharm. Lond.*, 1851, wrote: "Anise oil is stated to be adulterated with oil of star-anise, which is sometimes sold for that of anise."

At the present time by far the greater portion of anise oil of trade is that of star-anise; indeed, I am informed on very high authority that for every pound of "aniseeds" oil (*Pimpinella Anisum*), one would meet with a thousand pounds or even more of "star-anise" oil (*Illicium anisatum*). That star-anise oil was largely imported as far back as 1838 is certain from reference to a circular issued in that year on the authority of the "Druggists' Club," on the import of drugs (and among them star-anise oil) from China and the East Indies, and the conditions on which they should be sold on entering the Port of London. I have no exact information as to whether the oil was used at that time for pharmaceutical or confectionery purposes. I have learned from my father that it was formerly the custom to mix much of the star-anise oil sold in the Port of London, in large cisterns, which process was termed "working," and according as this had been performed or not the product was sold by brokers as "worked" or "unworked" oil. This manipulation has of late years been looked upon as unnecessary, and I think rightly so, for a recent examination of trade samples obtained from ten London wholesale druggists proves conclusively that unusual uniformity exists, and that "bulking" the oils, whatever may have been the case half a century ago, is now unnecessary (see Table B.).

The author quotes the descriptions of oil of anise as given by the London Pharmacopœia of 1851, the British Pharmacopœias of 1864 and 1885, the United States Pharmacopœia, and by Pharmacographia, and suggests that the statements as to the solidifying points must have been based on one common authority, who, it would seem, fell into an error in its determination.

Before I allude to the changes that take place at the moment at which anise oils solidify, I should like to refer to the well-known fact that some liquids, such, for example, as water, saline solutions, etc.,

[1] Read before the Pharmaceutical Society of Great Britain, at an Evening Meeting in London, Wednesday, February 13; reprinted from *Phar. Jour. and Trans.*, Feb. 16, p. 647.

when at absolute rest are capable of being cooled many degrees below their normal point of congelation without becoming solid. But when a liquid solidifies after being cooled below its normal freezing point, the solidification is accompanied by a disengagement of heat, which is sufficient to raise its temperature from the point at which solidification begins up to its *ordinary or true congealing point.* This physical law and its application to anise oils is the key-note of my communication this evening. The solidifying points of star-anise oil hitherto quoted have been *abnormal ones,* due to their determination whilst the fluid was at rest. The *true congealing point* is the temperature to which the thermometer immediately rises, on this solidification taking place. The oil of pimpinella does not present such a marked difference in respect of its *abnormal and true* congealing points, but as I will proceed to show, that of star-anise presents a strange dissimilarity.

TABLE A.

SOURCE OF OIL.	Abnormal solidifying point.	True solidifying point.	Color reaction with alcoholic HCl.
	Fahr.	Fahr.	
Star-anise (German).....	31	52	Yellowish brown.
Star anise (own distillation).	24	49	Yellowish brown.
Star anise (direct import from Macao, China)..	34	56	Pale brown.
Star-anise (broker's sample).	36	54	Brown.
Anise fruit(German).	50	59	Manganese pink.
Anise fruit (own distillation)	50	59	Manganese pink (fading quickly).

Table A will, I think, show that the margin allowed by the Pharmacopœia for the pimpinella oil, viz., from 50° to 60° F., is practically the difference between the abnormal and normal solidifying points, and is therefore correct, but that the congealing point quoted for star-anise oil is its *abnormal one,* and is therefore, I think, incorrect. Moreover that between the true or *normal* solidifying points of pimpinella and illicium oils there is practically no difference, and it is only between their *abnormal* congealing points that a wide divergence exists.

How then are we to frame "characters and tests" that will distinguish these oils? Either (1) we must say, that the solidifying point, taken when the liquid is at rest, of "pimpinella" oil is about 50° F.,

whilst "illicium" oil is about 35° F., *i. e.*, their *abnormal congealing points*, which, to my mind, has the disadvantage of being somewhat unscientific; or,

(2) We must find some easily applied distinguishing test. The one I would suggest is that proposed by Eykmann,[1] which I have found most efficient, viz., a saturated solution of hydrochloric acid gas in absolute alcohol, which reagent affords with "pimpinella" oil a beautiful manganese pink, whilst with "illicium" oil, only a pale brown color is shown, as will be seen by reference to Table A. The test is more strikingly apparent with the "natural" oils, than with oils that have been subjected to rectification, but even in the latter case, it is still sufficiently delicate to admit of no confusion.

In "*Pharmacographia*" 1st edit., page 278, the authors write: "We are unable to give characters by which these oils can be discriminated, although they are distinguished by dealers."

With the authentic specimens, which I have placed on the table, I am convinced there are very few in this room, who possess anything like a delicate olfactory organ, who cannot with ease distinguish between the one and the other; indeed, there may be dealers in this room, who would blindfold, distinguish between aniseeds and star-anise oils.

TABLE B.

(*Indicating Examination of Trade Samples.*)

SAMPLE.	Abnormal solidifying point.	True solidifying point.	Color reaction with alcoholic HCl.
	Fahrenheit.	Fahrenheit.	
No. 1	31	54	Almost colorless.
No. 2	34	53	" "
No. 3	33	53	" "
No. 4	38	54	" "
No. 5	39	57	" "
No. 6	36	54	" "
No. 7	31	54	Yellowish-brown.
No. 8	35	57	Almost colorless.
No. 9	39	58	Yellowish-brown.
No. 10	39	56	Almost colorless.
Average of 10 samples	35·5	55	

The "pimpinella" oil, you will note, has a peculiar fatty smell,

[1] *Pharm. Journ.*, vol. xi., p. 1046.

quite absent from the "illicium" oil. Part of this peculiar odor is, I am aware, removed commercially by fractional rectification, but even after this process the odor is unmistakable. Summarizing, then, I would suggest that some modification of the characters and tests of the Pharmacopœia be made in future editions, presuming, of course, that the compilers consider it of sufficient importance to distinguish between the two oils. Judging from the text of the present edition, they do think this desirable, and therefore I would suggest the "characters and tests" in the future should embody the points I have raised, and which I trust I have conclusively proved.[1]

SEVENTH DECENNIAL CONVENTION FOR REVISING THE PHARMACOPŒIA OF THE UNITED STATES OF AMERICA.

Notice is hereby given that, in accordance with and by virtue of the authority vested in me by the Convention of 1880, I hereby call upon the several incorporated Medical Societies, incorporated Medical Colleges, incorporated Colleges of Pharmacy, and incorporated Pharmaceutical Societies throughout the United States of America, The American Medical Association, and The American Pharmaceutical Association, to elect a number of delegates, not exceeding *three*, and upon the Surgeon-Ceneral of the Army, Surgeon-General of the Navy, and the Surgeon-General of the Marine Hospital Service to appoint, each, not exceeding *three* medical officers to attend a General Convention for the Revision and Publication of the Pharmacopœia of the United States of America, to assemble in the city of Washington, D. C., on the first Wednesday of May, 1890 (May 7th), at twelve o'clook noon.

The several bodies, as well as the Medical Departments of the Army, Navy and Marine Hospital Service, are hereby requested to submit the Pharmacopœia to a careful revision, and to transmit the result of their labors to the Committee of Revision at least three months before the meeting of the General Convention.

The several Medical and Pharmaceutical bodies are hereby requested to transmit to me, as the President of the Convention of 1880, the names and residences of their respective delegates, as soon as they shall have been appointed; a list of these delegates shall thereupon be published under my

[1] In the discussion following the reading of this paper, it was stated that the rectified oils would not give the same color reaction as the original oils, and that Professor Flückiger had oils of star-anise in his possession congealing at temperatures varying from 50° to 32° F. Allusion was also made to changes possibly occurring on keeping by the partial conversion of crystallizing anethol into uncrystallizing anethol.

authority, for the information of the medical public, in the newspapers and the medical journals in the month of March, 1890.

In the event of the death, resignation or inability of the President of the Convention of 1880 to act, these duties (in accordance with the resolution of that Convention) shall devolve, successively, in the following order of precedence: Upon the Vice-Presidents, the Secretary, the Asst. Secretary, and the Chairman of the Committee of Revision and Publication of the Pharmacopœia. These officers are as follows: *First Vice-President*, Samuel C. Busey, M. D., of Washington, D. C.; *Second Vice-President*, P. W. Bedford, Ph. G., of New York; Secretary, Frederick A. Castle, M. D., of New York; *Assistant Secretary*, C. H. A. Kleinschmidt, M. D., of Washington, D. C.; *Chairman of Committee of Revision*, Charles Rice, Ph. D., of New York; *First Vice-Chairman of the Committee of Revision*, Joseph P. Remington, Ph. M., of Philadelphia, Pa.; *Second Vice-Chairman of the Committee of Revision*, C. Lewis Diehl, Ph. G., of Louisville, Ky.

At the General Convention held in Washington, D. C., on the fifth day of May, 1880, the organizations and bodies enumerated in the Abstract of the Proceedings of the National Convention of 1880, on pp. xv. to xviii. of the U. S. Pharmacopœia of 1882, were recognized as being entitled to representation.

If any body other than those admitted in 1880 shall desire a representation in the Convention of 1890, it is suggested that the proof of incorporation, signed by the Secretary of State, of the State which shall have issued the charter, or by properly qualified public officials of the United States, be presented with the credentials of the delegation.

A blank form of certificate of appointment of delegates will be sent upon application by letter to my address, care of Dr. Edwin H. Brigham, Assistant Librarian of the Boston Medical Library, 19 Boylston Place, Boston, Mass. (Signed) ROBERT AMORY,

President of the Convention of 1880.

Boston, March 9th, 1889.

AMERICAN PHARMACEUTICAL ASSOCIATION.

The thirty-seventh annual meeting of the American Pharmaceutical Association will be held in San Francisco, Monday, June 24th, first session at 3 o'clock P. M.

The California members have repeatedly extended an invitation to the Association to meet in San Francisco, and now that the invitation has been accepted it is earnestly desired that every member will make an effort to attend.

Excursions and round trip tickets at low rates have been arranged for from all points. Full information will be furnished in the usual annual circulars, which will be issued by the Permanent Secretary early in May.

The California State Association has decided to hold its annual meeting at the same time and place with our own, which will largely add to the number and interest of the meeting.

The Exhibition, notwithstanding the great distance and cost of transpor-

tation, will be equal to any that has heretofore taken place. The exhibit will be in Odd Fellow's Hall, the same building that the sessions of the Association are held in. For space and all other information application may be made to the local Secretary, Mr. E. W. Runyan, No. 53 Stevenson street, San Francisco.

M. W. ALEXANDER, *President.*

MINUTES OF THE PHARMACEUTICAL MEETING.

APRIL 16, 1889.

The meeting was called to order and Mr. Alonzo Robbins was elected chairman. The minutes of the last meeting were read and no corrections being called for they were approved.

The registrar exhibited a sample of East Indian Red Bark, sent to the curator of the museum by Messrs. Gilpin Langdon & Co., of Baltimore, and containing 6·22 per cent. total alkaloids, of which 3·8 per cent. is quinine. A manuscript recipe book, commenced by Mr. Robert Shoemaker, about fifty years old, was presented to the library by Messrs. Wiley & Harris.

Mr. England sent samples of sulphonal, phenacetin, tartrate of chinoline, kairine and agaricin.

Professor Remington on behalf of Mr. Charles A. Heinitsh, of Lancaster, presented a wooden mortar which had been used for at least sixty years; to preserve such a mortar, it is necessary to keep it dry. He also presented a stoneware retort which was made in this city about fifty or sixty years ago, by Mr. Abraham Miller who manufactured all kinds of pottery and stoneware. The thanks of the College were voted to the donors.

Dr. Lowe read a paper upon *Commercial Tar*, a subject referred to him at the January meeting; this was accompanied with samples of tar and ointment made both from tar supplied by Mr. Good and some obtained from another source.

Mr. McIntyre also exhibited several samples of tar.

Mr. Procter spoke of the dispensing of tar and said that in his opinion it was best kept for this purpose in a half gallon coffee pot, which had the strainer holes enlarged; then when a quantity was called for place the receptacle upon the scales, balance it and pour in the required quantity. Some thought it might be very conveniently kept in two, four, or eight ounce boxes ready for dispensing, but this was regarded as encouraging grocers and others to deal in it.

Prof. Maisch inquired what kind of tarry products were obtained in the process of making acetic acid by the method used by Dr. Squibb, by subjecting the wood to a definite temperature? Prof. Remington said the temperature was so controlled that no tar was obtained. Prof. Maisch stated that some years ago the "Berichte" published in Berlin contained a paper giving the results of researches made with material furnished by Dr. Squibb, which consisted of empyreumatic products, but differed greatly from ordinary tar. The wood as prepared for the process of acetic acid making was exhibited by Prof. Remington and also the wood after torrefaction, the latter being

much changed in color, but still could be used for a variety of purposes in the arts.

In regard to the color of the different samples of tar ointment, Prof. Remington remarked that a small quantity of water in the tar, well incorporated, would cause the color to become much lighter. In connection with this subject, he exhibited samples of *wood creasote* and of *carbolic acid*, which were in the cabinet of Professor Procter some thirty years ago and had been sold in the market as creasote. Attention was called to the fact that at one time the two substances were regarded as being chemically identical, though differing in the degree of purity.

Mr. Mœrk read a paper upon *olive oil*, giving a comparison of American and European made oils. The paper elicited a good deal of discussion. Prof. Sadtler suggested that oils having different saponification numbers might also show different forms of crystallization under the microscope. No such comparison had been made. Referring to a sample of Lucca oil in Florence flasks, which Mr. Mœrk had found to give a brown, but not a red color, with sulphuric acid, Prof. Maisch stated that some years ago he had examined a number of commercial samples in Florence flasks, which were sold as Lucca oil, and found them to give a decidedly red color with the reagent.

Dr. Lowe exhibited three specimens of *dragon's blood* which differed in color, and when treated with alcohol left different amounts of insoluble matter; he thought the drug as found in commerce seemed to contain less resin and more vegetable fragments, than formerly.

Mr. Beringer read a paper on *expressed oil of almonds*. He had observed that the soap of an oil adulterated with peanut oil produced with hydrochloric acid a green color; after considerable experimenting he found this result would only occur when sesame and peanut oil were both present.

Prof. Maisch alluded to the subject of the *cleansing of mortars*, which had been alluded to at the March meeting, and read a paper upon the subject by Mr. H. M. Wilder. The general subject of cleansing different implements led to the remark that scale pans of a fine scale should always be protected by papers, so that they would not be soiled by the material weighed. Mr. Procter spoke of the use of strong sulphuric acid for the cleaning of mortars; after all parts of the mortar had been well covered with the acid, this is poured into another; this is continued till all the mortars had been treated alike; the result would pay for the trouble, the mortars being nice and bright. Mr. Boring found a very efficient cleanser in a mixture of sal soda and caustic lime with sufficient water; after standing some hours the mortars are left bright, both inside and out. The use of bichromate of potassium with sulphuric acid was also mentioned as being useful for the removal from mortars of substances not attacked by sulphuric acid or by alkalies.

Mr. Boring had found starch in the commercial *powdered slippery elm bark;* that it should not be present he satisfied himself by chipping some bark up and testing it with iodine, no starch being indicated. A member stated that *ground* elm bark could be obtained in the market free from starch.

The subject of *saffron* was discussed. An article was supplied as pure, but

an examination proved that it was not saffron, though a specimen of the spurious article had not been retained. Attention was directed to new adulterations recently noticed by Mr. Adrian in Paris, and by Mr. Holmes in London, and which consisted in impregnating true saffron with various salts and with coloring matters; fixed salts may be detected by the increased amount of ash left on incineration, which for true saffron should be between 5 and 6 per cent.; but ammonia salts and organic compounds could not thus be detected. The tinctorial power of commercial saffron may afford a convenient way for testing the purity of saffron, if tests for the absence of coal tar and similar colors can be devised, as has been recently shown by Mr. Barnard S. Proctor for Bismarck brown, the yellow solution of which is turned deep brown and turbid by a little tincture of iodine, which has scarcely any effect upon an infusion of saffron.

There being no further business, on motion adjourned.

T. S. WIEGAND,
Registrar.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

Philadelphia College of Pharmacy.—For about two years the Trustees have had under consideration an extension of the courses of instruction, and after considering several plans, it has been finally decided to retain for the present the division into a junior and senior course, and to lengthen the instruction in each from three to four weeks. The new arrangement will go into effect next fall. As heretofore, the lecture course will commence October 1st, and the matriculation list will be closed October 15th, after which time students will be admitted for special branches only. The preliminary junior examinations will be held as heretofore—early in November and December, and the same number of lectures will be delivered each week, namely, six to the junior and six to the senior class. But instead of holding the final junior examinations at the middle and the senior examinations at the end of February, the former will hereafter take place after the close of the first week in March, and the latter at the end of March, whereby the number of lectures will be increased by twenty in the junior course and twenty-four in the senior course. The commencement exercises will necessarily be held one month later than in the past. Various improvements have also been made in the lecture rooms, and others are contemplated both for the lecture rooms and laboratories. Matriculation and examination fees will remain as formerly; the lecture tickets will be $15 for each branch in the two classes. Full third-course students will receive the lecture tickets free of charge, and students selecting the modified examinations will have their first-course lecture tickets made good for the second year.

The following gentlemen have been recently elected *honorary members* of the College: William Saunders, Ottawa, Canada; Dr. Edward R. Squibb, Brooklyn, N. Y.; J. Léon Soubeiran, Montpellier, France; Charles Tanret, Paris, France; Anton Scheurer von Waldheim, Vienna, Austria; Michael

Carteighe, F. C. S., London, England; Dr. Wm. Dymock, Bombay, India; and the following graduates of the College: Frederick Gutekunst, class 1853, Philadelphia, and Dr. Robert Battey, class 1856, Rome, Ga.

The Pharmaceutical Examining Board of Pennsylvania calls attention to the last clause of section seven of the Pharmacy Act, which provides that "All other assistants actually engaged in the business at the passage of this Act shall, upon the completion of a like term of two years' experience, be entitled to registration as qualified assistants without examination." This clause will expire on the 24th day of May, 1889, and all persons entitled to registration thereunder must promptly apply for the same.

At the examination held at Scranton in April, 36 candidates applied for certificates as registered pharmacists, and 16 as qualified assistants. Sixteen of the former and thirteen of the latter were successful.

The Bufialo College of Pharmvcy held its commencement in Music Hall, March 26th, when fourteen young men and two ladies graduated. A prize of $50 for the best thesis upon a subject assigned by the faculty was awarded to F. S. Marsh, of Lander, Pa. The commencement of the Medical College was held at the same time. The valedictory address was delivered by Prof. G. H. Fox.

The Albany College of Pharmacy, at its eighth annual commencement, had 22 graduates. Prizes were awarded to Henry G. Miner, of the graduating class, and to Howard J. Coyne, of the junior class.

The New York College of Pharmacy held its fifty-ninth annual commencement April 16th, at Steinway Hall.

Michigan State Pharmaceutical Association.—Proceedings at the sixth annual meeting held at Detroit, September 4th to 7th, 1888. Ann Arbor. 8vo., pp. 227. A brief account of this meeting will be found on page 588 of our last volume. Next meeting at Detroit, September 10th. Arthur Bassett, Local Secretary.

New Hampshire Pharmaceutical Association.—Proceedings of the fifteenth annual meeting, held at Claremont, September 25th and 26th, 1888. Claremont. 8vo., pp. 30.

President for the current year is G. F. Underhill, Concord; and Secretary, C. B. Spofford, Claremont.

North Carolina Pharmaceutical Association.—Minutes of the ninth annual meeting, held in Goldsboro, August 8th and 9th, 1888. Raleigh. 8vo. pp. 102.

The tenth meeting will be held at Durham during the present month, on the third Tuesday.

EDITORIAL DEPARTMENT.

Convention for the Revision and Publication of the Pharmacopœia of the United States of America.—On another page we publish the official call for a General Convention to assemble in Washington, D. C., at noon of May 7th, 1890, for the purpose of providing for a Revision and Publication of the Pharmacopœia

of the United States of America. Every incorporated medical or pharmaceutical college, association or society, desiring to be represented in the Convention, is requested to send its corporate title and a list of its officers and delegates to Dr. Robert Amory, President of the Convention of 1880, care of Dr. Edwin H. Brigham, Assistant Librarian of the Boston Medical Library, 19 Boylston Place, Boston, Mass., in order that a list of the bodies to be represented may be published as directed by the Convention of 1880.

American Pharmaceutical Association.—In the March and April numbers we published a brief account of the traveling arrangements made from St. Louis and from eastern points. We have since learned that the members and their friends may join either party by purchasing from their station round-trip tickets, whichare good for six months with stop-over privilege wherever desired, and with the privilege of returning by any of the transcontinental lines, terminating in San Francisco, without additional charge. Returning by way of Oregon will cost $15 additional for the trip from San Francisco to Portland.

In these respects the two excursions planned are identical in cost. The differences may be summed up as follows:

The route of the western excursion is through Kansas to Denver; thence to Georgetown, etc., return to Denver; thence to Salt Lake City and westward. The eastern excursion will pass through Nebraska to Denver, thence to Manitou, Pueblo, and through the heart of the Rocky Mountains to Salt Lake City, and from there westward.

The western excursion charges in addition to the fare a certain sum which includes sleeping car and hotel accommodations, meals and other necessary expenses on the trip from the Missouri river to San Francisco. The eastern excursion has identical expenses for railroad fare and sleepers, to which must be added cost of meals and hotels *en route*, which may be moderate or extravagant, according to individual taste.

That the northern route will be preferable for the return trip in July, we think, will be readily conceded.

Circulars giving full details may be obtained by addressing Dr. E. Sander, 129 South Eleventh street, St. Louis, Mo., and Prof. Emlen Painter, Broadway and Thirty-fourth street, New York.

The meeting will be held in Odd Fellows Hall, where also a hall has been secured for exhibition purposes. The headquarters will be at the Palace Hotel; the rates are $2.50 for inside rooms with board, and front rooms at a moderate advance. Further particulars will be given in the Secretary's circular.

Eucalyptus Honey.—The Australian *Journal of Pharmacy* for February, 1889, contains the following:

Eucalyptus Honey.—This is the latest Australian fraud. The preparation is said to be the natural product of the eucalyptus tree as gathered by the wild bees of Australia, and is reputed to be of great medicinal value. We have examined a sample of this mysterious product, and have no hesitation in declaring that it is a mechanical mixture of leaf eucalyptus oil with ordinary honey. * * * It is impossible to say what is the exact nature

of the substance as originally discovered, but from the sample produced in Sydney, and reputed to be the above, there can be no doubt as to its origin and as to the process of its manufacture. We fear the learned doctor (Dr. Thos. Caraman) has been the victim of a practical joke.

Under the title of "Natural Eucalyptated Honey," an account of the pretended discovery of the medicinal virtues of this article was published in this journal, 1887, page 471; it should be corrected in accordance with the above information.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Hand-book of Materia Medica, Pharmacy and Therapeutics.—Compiled for the use of students preparing for examination. By Cuthbert Bowen, M. D., B. A., editor of "Notes on Practice." Philadelphia and London. F. A. Davis, publisher. 1888. 12mo. Pp. 366. Price, $1.40.

This book is intended as an epitome of the branches named in the title suitable for medical students, and lays particular stress upon the physiological action, therapeutical uses and doses of the different drugs, which necessarily are classified from the physician's standpoint according to their medical properties as astringents, tonics, stimulants, etc. In a preliminary chapter on "Method of Study," the author gives some sound advice insisting on practical work by the student himself, with which we fully concur, only wishing that the importance of practical labor on the part of the student had been still more forcibly presented. The accounts of weights and measures, including the metric system of prescription writing, combination of drugs, incompatibilities, etc., though brief, give the salient points in each case.

The remaining portion of the book is in the form of a catechism, which is well adapted for reviewing, and may be very acceptable to students accustomed to memorize, but should not replace more systematic study. As stated before, it is intended for medical students, and young practitioners will doubtless also find it useful inview of the concise manner in which the various statements had necessarily to be made, and on account of the large number of prescriptions introduced into the text. It is not stated why the author did not follow the Pharmacopœia in all cases; for instance, in the origin of acacia (p. 325), calumba (p. 104), elaterin (p. 283), squill (p. 236), etc. Some of the statements are quite vague and, therefore, unsatisfactory; thus, opium is the concrete milk juice, not the dried juice, of the poppy (p. 192); starch can not be said to be an active principle of calcumba (p. 104); the commercial term of liquorice is used for the extract, not for the root (p. 327); phosphate of quinine is not insoluble in water, and acetate of quinine (p. 16) does not form heavy, but on the contrary very light and bulky crystals. If the place of growth is intended for the country in which medicinal plants are indigenous, then the habitat of hyoscyamus (p. 206), cubeb (p. 298) and benzoin (p. 308) is given incorrectly.

The mechanical part of the work—paper, typography and binding—is quite attractive, and but few typographical errors have been observed by us.

Electricity in the diseases of Women, with special reference to the application of strong currents.—By G. Betton Massey, M. D., Physician to the nervous department of Howard Hospital, etc. Philadelphia and London: F. A. Davis, 1889, 12 mo. Pp. 210. Price $1.50.

The aim of the work is expressed by the author in the preface, where he states that "only such conditions receive notice in the treatment of which electricity has recently been urged upon professional favor; and this portion of the work, partakes, therefore, more of the nature of the author's daily work, than of a classical research into the literature of the subject." The experience of others has been utilized as a guide for further investigations, and precautions have been taken to demonstrate the effect of electrical applications, uninfluenced by other remedies. Introductory to the treatment of the various affections, the different kinds of apparatus are described, as well as the qualities and effects of the currents under different conditions, and in an appendix directions are given for making the battery fluid, and for other details in connection with the apparatus used.

The work will doubtless prove of great value to the practitioner interested in the subject, the practical points of which are explained by a number of useful illustrations, in addition to the clear descriptions.

Digest of Criticisms of the United States Pharmacopœia, sixth decennial revision (1880), New York, 1889. 8vo. Pp. 189.

This digest has been prepared by Mr. Hans M. Wilder, and has been published by the Committee of Revision and Publication, of which Dr. Charles Rice is chairman. It is intended as an aid to those bodies which may be engaged in the preliminary revision of the Pharmacopœia for next year's convention. The work is not for sale, but may be obtained from the chairman by those interested in pharmacopœial revision by forwarding the postage, which is 8 cents per copy.

Atti della terza Riunione d' Igienisti Italiani, tenuta nell' Ottobre, 1888, *in Bologna. Milano: Stabilimento Giuseppe Civelli.* 1888; 8vo.; pp. 222.

Proceedings of the third reunion of Italian hygienists.

Transactions of the American Dermatological Association, at its twelfth annual meeting, held in Willard's Hotel, Washington, D. C., September, 1888, in connection with the first meeting of the Congress of American Physicians and Surgeons. Official report by the Secretary, G. H. Tilden, M. D., Boston; 8vo.; pp. 126.

Thirtieth Annual Report of the Inspector of Milk and Vinegar, Boston, from January 1st to December 31st, 1888. 8vo.; pp. 126.

Report on Hydrophobia. By Chas. W. Dulles, M. D., of Philadelphia. Pp. 8.

Reprint from the Transactions of the Medical Society of the State of Pennsylvania.

A Defence of Electrolysis in Urethral Strictures, with Documentary Evidence. By Rob. Newman, M. D., New York, etc.

Reprint from the *Medical Register*, January 5, 1889.

The Debt of Medical and Sanitary Science to Synthetic Chemistry. By Prof. Saml. P. Sadtler, Ph. G.

Reprint from the Journal of the Franklin Institute, March, 1889.

The Psychic Life of Micro-Organisms. A Study in Experimental Psychology. By Alfred Binet. Translated from the French By Thomas McCormack, with a preface by the author written especially for the American edition. Chicago: 1889. The Open Court Publishing Company. Cloth, 75 cents. Paper, 50 cents.

Tne author is a collaborator of Ribot and Féré, and one of the most eminent representatives of the French school of Psychology. In the above work he presents the most important results of recent investigation into the world of micro-organisms, which branch of comparative psychology is little known, as the data lie scattered for the most part in isolated reports and publications, and no attempt has hitherto been made to collate and present them in a systematized form. The field covered by this book may be seen from the headings of the various chapters, which relate to the motory organs and the organs of sense; to nutrition and the psychology of nutrition; to colonies and psychology of minute organisms; to fecundation in low and higher animals, and in plants, and to the physiological function of the nucleus. Perhaps the most interesting chapters are those on fecundation, which demonstrate spermatozoids to have instincts and vital powers analogous to those found in animals of higher organization. The various subjects are illustrated by eighteen cuts. M. Binet's researches and conclusions show, that psychological phenomena begin among the very lowest classes of beings; they are met with in every form of life from the simplest cell to the most complicated organism, and that there is an aggregate of properties which exclusively pertain to living matter, the existence of which is seen in the lowest forms of life as well as in the highest.

College Botany, including organography, vegetable histology, vegetable physiology and vegetable taxonomy, with a brief account of the succession of plants in geologic time, and a glossary of botanical terms. By Edson S. Bastin, A. M., F. R. M. S., Professor of Botany, Materia Medica and Microscopy in the Chicago College of Pharmacy. Chicago: G. P. Engelhard & Co. 1889. 8vo., Pp. XVI, and 451.

The first edition of this work appeared two years ago under the title of "Elements of Botany," and was welcomed as supplying a long-felt want. The second edition, which is now before us, has been almost entirely rewritten, and is considerably enlarged, the most copious additions being in Part IV., "Vegetable Taxonomy,' and in Part. II., "Vegetable Histology." But the parts treating of Organography and Physiology, as well as the Glossary,

have also been considerably amended, so that in its present shape the work serves its purpose even better than it formerly did; the more so since the illustrations have been increased in number to nearly six hundred. In other respects, we refer to our favorable notice of the first edition, and heartily recommend the work alike to teachers and student.

Merck's Index of Fine Chemicals and Drugs for the Materia Medica and the Arts. By E. Merck, 1889. 8vo. Pp. 156. Price, $1.

This Index is a complete list of chemicals used at the present time in medicine and the arts, and gives for each the common name and the various scientific synonyms, and in the case of many proximate principles also their origin. We transcribe a few as examples:

Aseptol (ortho-Phenol-sulphonic [ortho-Phenyl-sulphuric, ortho-Sulpho-phenic, ortho-Sulpho-carbolic] Acid; ortho-Sulpho-phenol [-carbol]—in 33⅓ per cent. solution) [Sozolic Acid].

Manna sugar, Mannit (Mannitol, Mannol; Fraxinin, Granatin; formerly also called Punicin).

Resorcin (Resorcinol; meta-Di-oxy-benzene).

Cedrin from Cedron seed.

Anemonin (Anemone-camphor, Pulsatilla-camphor).

Rotoin from Japanese belladonna.

It will be seen from the foregoing that this Index will be very useful as a kind of dictionary of the nomenclature of chemical substances used at the present time. Certain pharmaceutical preparations are also included. The whole is arranged so as to serve as a price-list, for which purpose several blank columns are found on each page, and the names—common as well as synonyms—are placed in alphabetical order. At the end of the names under each letter sufficient blank space has been left for the addition of newly introduced compounds, so that this Index in its present shape may retain its value for a considerable length of time.

A Laboratory Guide in Chemical Analysis—By David O'Brine, E. M., M. D., D. Sc., etc. Second edition, entirely rewritten and revised. New York: John Wiley & Sons, 1889. 8vo. Pp. 237. Price, $2.

The eight chapters into which the text is divided refer to the reagents, tests in the dry way, tests in the wet way (metals), acids, comparison of bases and acids, water analysis, poisons and general stoichiometry. The material under each head is conveniently arranged for the use of the attentive student, and the instructions given are brief, but clear, and as a rule ample. The tables in chap. V. giving the behavior of the different groups of bases and acids towards the principal reagents, might, perhaps, have been more conveniently assigned to the respective groups of the bases and acids in two preceding chapters. Although the work is evidently intended for students possessing some knowledge of chemistry, it appears to us that the laudable conciseness of the text should not have prevented the stating cer-

tain details in some reactions, more particularly of poisons, as for example the behavior of ferric salts towards formates, acetates, sulphocyanates and meconates (pp. 150, 151, 171, 198). The work is thoroughly practical, and shows the author to be a careful observer and teacher in his capacity of professor in the Colorado State Agricultural College and chemist of the Experiment Station. In addition to this the care bestowed upon the proof reading deserves commendable mention; also the general appearance of the book. But we think that the Index might be improved; for in referring to it for information about the forensic recognition of such poisons like arsenic, meconic acid, phosphorus and others, one would scarcely look for them under "alkaloids."

An elementary Textbook of Chemistry. By Wm. G. Mixter, Professor of Chemistry in the Sheffield Scientific School of Yale University, New York: John Wiley & Sons, 1889, 12mo, pp. X and 459. Price $2.50.

This very useful book for students opens with a chapter on chemical physics, which is followed by a general account of elements, atomic weight, symbols and formulas, after which the different elements are considered. With the view of presenting the subject in such a manner that the student may grasp the fundamental principles of the science, and at the same time learn something of the chemistry of common things, the periodic classification has been adopted; acidic and basic groups are treated alternately; experiments to be performed by the students are fully described; graphic, constitutional and empirical formulas are made use of as occasion requires; about 90 well executed woodcuts have been used for illustrating apparatus, crystals, etc.; and by the use of different kinds of type the commoner and rarer substances are distinguished. The work well deserves the attention of teachers of chemistry as a useful textbook for students. The make up of the book is creditable, and proofreading has been very carefully done.

International Pocket Medical Formulary, with an appendix containing posological table; formulæ for inhalations, suppositories, nasal douches, eyewashes and gargles; hypodermic formulæ; use of thermometer in disease; poisons and their antidotes; post-mortem and medico legal examinations; artificial respiration; ligation of arteries; obstetrical table; urinalysis; differential diagnosis of eruptive, typhoid and typhus fevers; tables of pulse temperature, respiration; motorpoints, etc. By C. Sumner Witherstine, M. S., M. D., etc. Philadelphia and London: F. A. Davis, 1888. XIV and 269. Price $2.00.

All but forty pages of the book contain prescriptions, 1658 in number, of prominent physicians of different countries. These formulas are arranged according to the ailments for which the medicines are recommended, and the diseases are enumerated in alphabetical order. The contents of the remaining 40 pages are sufficiently explained in the title. The book is of convenient size to be carried in the pocket, is well bound, and is provided with sufficient blank paper for notes and memoranda.

Warner's Therapeutic and Reference Book. Philadelphia: Wm. R. Warner & Co., 1889. 12 mo., pp. 119. Price $1.00.

Notes on weights and measures, on prescription writing, on incompatibles, on poisons and antidotes; tables of doses, of digestibility of food, of eruptive fevers, etc., occupy about 50 pages of the book, the remainder consisting of a formulary, of which the main portion is arranged alphabetically; the prescriptions are by prominent physicians, mostly American and English practitioners.

American Resorts; with Notes Upon Their Climate.—By Bushrod W. James, A. M., M. D., &c. With a translation from the German by Mr. S. Kauffman of those chapters of "Die Klimate der Erde," written by Dr. A. Woeikoff, of St. Petersburg, Russia, that relate to North and South America and the islands and oceans contiguous thereto. 8vo., pp. 285, cloth. Price, $2.00.

The author states upon the title page that the work is intended for invalids and those who desire to preserve good health in a suitable climate. Having been written for the general public, we do not find in the book learned arguments of the curative effects of certain localities or of mineral springs. The work is descriptive rather than argumentative, and on looking over its pages one is apt to regret that the descriptions are not more lengthy. But these, though brief, are sufficient to convince the reader, if he did not already know it, that—so the author states, "it seems scarcely necessary for Americans to seek relief at the resorts of the humid Riviera, or at the more questionable places of health resorts which afford the excitements and unsanitary accompaniments of city life, when in their own land they may enjoy equally good or even superior climates."

A large map of North America, giving the railroad systems of Canada, the United States and Mexico, is bound with the book, the perusal of which we heartily recommend to those who wish for information about the numerous health resorts of this continent.

Record of Experiments conducted by the Commissioner of Agriculture in the *Manufacture of Sugar from Sorghum* at Rio Grande, N. J.; Kenner, La.; Conway Springs, Douglass and Sterling, Kan., in 1888. 8vo., pp. 162.

A report edited by H. W. Wiley, chemist, and published as Bulletin No. 20 of U. S. Department of Agriculture, Division of Chemistry.

Sixth Annual Report of the Board of Control of the State Agricultural Experiment Station at Amherst, Mass., for 1888. 8vo., pp. 263.

The experiments were carried on under the direction of Prof. C. A. Goessmann.

Report of the Pennsylvania State College for the year 1887. Part II. Agricultural Experiment Station. Pp. 226.

The printing of the report which is dated January 30, 1888, was delayed. The experiments were conducted by Prof. Wm. Frear, and later by Prof. H. P. Armsby.

Second Biennial Report of the California State Board of Forestry for the years 1887–88. 8vo., pp. 182.

A very interesting document, the greater portion of which consists of an account of the pines (Pinus) indigenous to California. Besides a number of county maps showing the extent of forests and kind of timber, the report contains many photographic plates of the different species of Pinus, and of their leaves and cones.

Der Kohlensäure-Gehalt der Luft in Dorpat bestimmt in den Monaten Juni bis September, 1888. Von Jacob Heimann.

The amount of carbonic acid in the atmosphere of Dorpat determined during the months of June to September, 1888.

Studien über dem gerichtlich-chemischen Nachweis von Blut. Von Adolph Klein.

Investigations on the forensic chemical determination of blood.

Untersuchungen über das Verhalten der Fette zu Zuckersolutionen. Von Theo. Pacht.

Researches on the behavior of fats to solutions of sugar.

The above three pamphlets are inaugural essays, and describe experimental investigations carried out in the laboratory of Prof. Dragendorff. Of especial pharmaceutical interest is the last mentioned dissertation on fats and sugars. From observations, Prof. Dragendorff had been led to regard certain sugars as being capable of rendering fats soluble in aqueous liquids. This is corroborated by the experiments of Dr. Pacht, which show that animal oils, as a class, are less soluble than vegetable oils, and among these the drying oils are more soluble. The solution in water is not promoted by sparingly soluble carbohydrates. Of the sugars, those only which emulsionize fats will also render them soluble in water. The saccharoses, more particularly cane sugar and maltose, have a greater solvent power than the glycoses. The solubility of fats varies considerably. Concentrated sugar solution dissolved nearly 2 per cent. of almond oil, but only 0·63 per cent. of olive oil. On adding a little oleic acid to the latter it was more readily emulsionized by the syrup, and probably more of it was dissolved. Linseed oil dissolved to the extent of about 4·5 per cent. Clear solutions in hot syrup usually become turbid on cooling, and on being diluted with water most of the fat is separated.

The History of Education in North Carolina. By Charles Lee Smith, Fellow in History and Politics, Johns Hopkins University. Washington, D. C. 8vo. Pp. 180.

This is one of the contributions to American educational history, which are edited by Herbert B. Davis, and published by the Bureau of Education.

OBITUARY.

Professor Michel Eugène Chevreul died in Paris, April 9th. Born at Angers, August 31, 1786, he studied chemistry under Vauquelin; became preparator of the chemical course in the Museum of Natural History; in 1813 was appointed professor in the lyceum Charlemagne; in 1820 was made examiner in the polytechnic school; in 1824 took charge of the dye works of the manufactory of the Gobelins; in 1826 was elected to the Academy of Sciences, and in 1830 was called to the chair of applied chemistry in the Museum of Natural History as the successor of Vauquelin. Chevreul continued to lecture at the Collège de France until a few years ago, and attended the sessions of the French Academy for over sixty years. He was remarkable for the intellectual vigor which he retained until the time of his death, when he had nearly completed his one hundred and third year. His contributions to science are very numerous, and extend over a period of about sixty years; the most important ones relate to the chemistry of colors and dye-stuffs, and to the composition of fats. The researches on the colors were commenced in 1807, and aside from the essays contributed to various periodicals, resulted in the publication of several special works in 1828, 1839 and 1864. His classical investigations of the composition of vegetable and animal fats, which form the basis of our present knowledge of these products, were commenced in 1811 and continued for a series of years; they led him to point out in 1818 the chemical resemblance of ethal (cetyl hydrate) to alcohol, and in 1823 to regard the constitution of fats as resembling that of the compound ethers.

Samuel W. Gross, M. D., Professor of the Principles of Surgery in the Jefferson Medical College, Philadelphia, died April 16th, in the fifty-third year of his age. He was born in Cincinnati, graduated at the Jefferson College in 1857, and occupied the chair of surgery in the same institution since 1882, when his father, the late Samuel W. Gross, retired, whom the son survived only five years. The deceased had established an excellent reputation as author, teacher and surgeon, and was apparently at the height of his usefulness when an attack of pneumonia terminated his earthly career.